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ORIGINAL ARTICLES.

TRAINING IN TUBERCULOSIS.

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AMIDST the conflicting recommendations of those interested in measures for combating tuberculosis one seeks in vain for comprehensive and co-ordinated schemes which would give certain promise of success. In the treatment of tuberculosis, perhaps, more than in any other disease, failure and disappointment, while discouraging, has not daunted workers. In no disease does fashion in therapeutics play so considerable and at the same time so ignominious a part. But there, nevertheless, appears to be almost a conspiracy to ignore or, at any rate, not to profit by the lessons of failure. There are waves of advocacy of this or that method of treatment, which in turn are condemned with often unnecessary emphasis. Tuberculin, domiciliary treatment, the sanatorium, the dispensary, the colony system, various forms of drug therapy, and other methods have their periods of popularity and disillusion. Yet in almost all there are elements of good. At some period or phase of tuberculous disease in the individual case each might play a useful part. One reason for such diverging views is found in the impossibility of the tuberculosis worker obtaining adequate experience in the employment of all methods; another is in the individual's inability to apply them at that particular phase of the disease when they would afford the greatest prospect of success. But this truism appears to be unrecognized or, at any rate, unexpressed. Instead of a co-ordinated harmonious service working with a definite policy, and offering the advantages of all the methods of proved utility

at just those periods when they are especially indicated, we find an inco-ordinate system of individual workers of varying ability and varying opportunity. There is an absence of team work, no "pull together," and administrative details swamp therapeutic effort. A multiplicity of forms are produced as evidence of work done, but in reality conceal defects, and are even of doubtful value for statistical purposes. The service, though vociferous, is inarticulate, as it possesses no authoritative voice.

Undeterred by the failures of the past, the spirit governing present-day thought and action would seem to be set on endeavours to remedy defects in existing procedures by ever seeking new methods, often in the nature of costly experiment, which, if the experience of the past is a guide, are of little more promise than many now discarded. At the moment the industrial colony or village settlement clamours for approval, and costly schemes are contemplated for their more general establishment. But is it sufficiently recognized that the success of the tuberculous colony depends more on the man who governs it than on any other factor? It by no means follows that what one man can do well and make successful will justify itself in other hands. Personality combined with knowledge and enthusiasm counts for much in the conduct of tuberculous work. And it may well be asked, what is being done to make success assured? It is easy to produce evidence of the existence of many methods, all of which have been supremely successful in the hands of some, while of little value when directed by others. It is true that genius is not always forthcoming; neither need it be sought. But what should be assured is a high general standard of competence. This can be attained if but facilities are afforded for its development. The failures in the tuberculosis campaign are not entirely due to defects from without; they may, at any rate, in part be ascribed to errors from within. And yet such defects are ignored, our diagnosis as to cause of failure is faulty, our resultant treatment for that failure is correspondingly incorrect.

In what direction, then, should improvement be sought? To my mind the outstanding need of to-day in the tuberculosis service is not so much further expenditure on material, but rather greater effort in the training of the personnel which must man the service, and co-ordination of the work with a well-thought-out and clearly-defined policy. The latter essential I do not propose to discuss at the moment, but the former may be dwelt upon here.

A *Mauretania* may be built and launched, but unless she is provided with a suitable crew under the command of a competent captain she will never cross the Atlantic. In tuberculosis we seek to build *Mauretanias;* to spend much on the construction and equipment. What do we do to ensure that they are satisfactorily manned by a trained crew?

To press the analogy further—a lumbering old tramp efficiently manned will do better work than the finest ship afloat with an untrained crew and without a skilled navigator in charge. By that I do not mean to infer that elaborate and costly schemes for the treatment of tuberculosis are not necessary, but I certainly do wish to imply that they will not meet with a full measure of success unless they are put into really competent hands. The present tendency appears to be to spend money lavishly on tuberculosis schemes, but to do little to ensure that their conduct is entrusted to highly-skilled workers.

The evil commences in our medical schools. The medical student of to-day is the medical practitioner of to-morrow, and the general practitioner is our first line of offence against tuberculous disease; yet it has been demonstrated by notification records that the early diagnosis of tuberculous disease is rather the exception than the rule. Relative to its importance comparatively little interest is taken in instruction in the prevention, diagnosis, and treatment of tuberculous disease in the medical schools. There is not a single professor of tuberculosis in any teaching school in England or Ireland, and only two, both recently appointed, in the United Kingdom. Few, if any, medical students ever enter any of the special institutions for the tuberculous except as patients. No encouragement is given to, and no inducement offered for, extramural work, and yet the student would derive immense advantage if opportunities were afforded him for such instruction. The benefit would not be wholly to the student; his presence in special institutions would be an incentive to greater effort. The teacher learns much in teaching. His work must be of a sufficiently high order to meet the needs of his pupil, who is quick to scorn incompetence, but equally impressed by knowledge and efficiency.

How many medical students, on qualifying as practitioners, are really competent to advise from practical acquaintance on one of the many special forms of treatment specially indicated for any particular subject of tuberculous disease at a particular phase of the infection? Yet such knowledge is often a matter of life or death to the patient. And what opportunities will he have for acquiring such knowledge?

A proper teaching unit should afford the fullest facilities for theoretical and practical instruction in all aspects of the tuberculosis problem. And these facilities should be available not only for the student, but also for the practitioner of medicine. To the latter they should be available in the form of short, carefully-planned, intensive, postgraduate courses, to which every inducement should be given for his attendance. Now that the treatment of tuberculosis is so rapidly being taken over by the State it would be a sound and wise policy if these postgraduate courses were not only available free of all cost, but also that the graduate student were boarded and lodged free of expense.

The community would benefit even more than the practitioner, and if the latter is prepared to give up his valuable time the former should see that at least he does so without expense to himself. If it pays the State to educate without fee an elementary school student, how much more profitable would it be to train further a valuable public servant!

In the tuberculosis service the same arguments should surely hold and be accepted as sound logic. At present the newly-appointed tuberculosis officer may have had little or no previous specialized instruction in tuberculosis in its varying manifestations. Opportunities for receiving such instruction after appointment rarely exist. Frequently he is working directly under a medical officer of health who, though called the chief tuberculosis officer, is an administrator rather than a clinician. Appointed to a dispensary, he often sees but one aspect of his official work, and that a painfully narrow one, and he has to acquire special knowledge as best he can. The very fact that the tuberculosis officer is already called an expert makes it the more difficult for him to seek or obtain what may truly be expert help. There are many highly trained and experienced workers in the tuberculosis service already, but the system in force does not enable them to impart readily their knowledge to colleagues less favourably situated. Usually there are none to whom the tuberculosis officer can apply, and when outside help is available it is, as the illuminating report of Dr. F. J. Kay Menzies shows, not readily sought. There is no compelling reason why this disastrous state should be allowed to continue.

I have frequently urged the institution of a diploma in tuberculosis which would strengthen the tuberculosis officer's hands, both by being evidence of wide acquaintance with all aspects of anti-tuberculosis activity and by elevating his outlook. But who would devote the time, labour, and expense required to such an end if it offered no personal or material benefit? The tuberculosis officer is usually so inadequately remunerated, has so little prospect of professional advancement, is in most cases not even on a plane such as that enjoyed by the postman and policeman, or other public servant, by the inducement of a pension on retirement, that recruits for the service would be almost unobtainable if the possession of a diploma were a necessary antecedent to employment.

The existing position is a serious one both for the community and the tuberculosis service. It is, however, not incapable of being improved. The present state of affairs has arisen largely through the service being hastily and imperfectly formed and without a full appreciation of the responsibilities involved. It is as if a number of fire engines were sent to extinguish a fire without specially-trained firemen or a responsible authority to direct the operations. The reward offered for individual successful work may be likened to one of these firemen

being transferred to some other branch of service at increased remuneration. In reality his special skill should be recognized and retained, and higher emolument offered. It is difficult to indicate the remedy without outlining the possibilities of added material benefit to each individual worker. A satisfactory homogeneous co-ordinated service would have a clear policy, would afford facilities for research, establish team work amongst workers suited for such advanced and combined effort, would possess higher special appointments where individual merit would be both retained and rewarded, and would, in short, offer all those advantages to the community and the worker at present denied to both.

If we assume that the average period of service for the individual worker be, say, twenty-five years, the community and the worker would both gain if a fraction, say even one-twenty-fifth of that time, were devoted to specialized training at the commencement of service in all matters connected with tuberculous disease, and would gain still more if during service additional short periods of special study leave were granted. This is a principle well recognized in other forms of public medical service, and it would be particularly valuable in so specialized a branch of medical activity as that of the tuberculosis service.

A thoroughly efficient tuberculosis service working with a well-defined policy and in co-operation with the general practitioner would constitute the most efficient instrument in combating tuberculous disease. Till it is instituted progress will be delayed, and discontent both within and without the service will continue. When it is accomplished advance will be rapid. It is to the man rather than to the method that the attention of the authorities should be now directed. The method should follow the trained man, not *vice-versa*.

THE INFECTIVITY OF TUBERCULOSIS.

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ALTHOUGH the discovery that tuberculosis is due to the tubercle bacillus first made it clear that each case must arise directly or indirectly from a preceding case of tuberculosis, writings and edicts of the seventeenth and eighteenth century, both in this country and elsewhere, deal with the subject, drastically in some instances.[1] Exactly how the infection

[1] Cobbett, Louis: "The Causes of Tuberculosis." Cambridge: The University Press. 1917.

takes place and how far we can prevent it are matters much more difficult to decide. After Koch's original discovery a belief in direct case-to-case infection was widely held and measures were advocated to this end; it was, however, considered too difficult to prevent the spread of the disease from tuberculous humans, and attention was directed mainly to tuberculous cattle.

From Koch's announcement that bovine and human tuberculosis were not identical dates the reaction from this view, and the conception of tuberculosis which began to be generally adopted was that of a universal disease the seed of which cannot be prevented, and which can therefore only be dealt with by attention to the soil and the surroundings of the living subject. It seems now as if we are entering on a third period, when importance will again be attached to the influence of the seed. It can hardly be denied that if we can prevent the tuberculous seed being implanted we can prevent tuberculosis, even in susceptible subjects, and this may not be so hopeless as would at first sight appear.

Many striking instances of direct infection have appeared in the literature of the subject from time to time. Among the latest of these is an instance recently published by May.[1] Six fishermen spent a season at sea in a small boat with another who had open pulmonary tuberculosis; five of the six, as well as the original patient, died within two years of phthisis. MacNalty[2] also mentions an outbreak of tuberculosis in a girls' home, forty cases occurring, with eleven deaths.

The problem of infection in tuberculosis can best be studied in an area of scattered rural districts and small towns such as South Devon mainly presents; moreover, the work of the tuberculosis officer here is carried out almost entirely in the homes of patients, and not at dispensaries, which enables one to get a much closer view of the problem.

Conjugal Tuberculosis.

Considering first the important question of *conjugal tuberculosis*, some regard the risks of infection under these circumstances as serious;[3] Pearson and others[4] take the opposite view and attribute any increased

[1] May, O.: "Some Aspects of the Tuberculosis Problem in Life Assurance." *Tubercle*, January, 1920.

[2] MacNalty: "Supplement to Fortieth Annual Report of the Local Government Board." 1919.

[3] Weber, H.: "On the Communicability of Consumption from Husband to Wife." Transactions of the Clinical Society, 1874, p. 144. Newsholme, A.: Transactions of the Epidemiological Society, xxv.

[4] Pearson: "A First Study of the Statistics of Pulmonary Tuberculosis: Marital Infection." Drapers' Company Research Memoirs, 1907. See also Pope, E. G., and Pearson: "A Second Study of the Statistics of Pulmonary Tuberculosis: Marital Infection." Drapers' Company Research Memoirs. London: Dulau and Co., 1908.

incidence of disease under these conditions to predisposition and causes other than direct infection. It is suggested, for instance, that so-called "assortative" mating will explain the difference—that is to say, a person predisposed to tuberculosis is attracted by, and mates with, another similarly handicapped.

I find that out of 156 cases in which the mate of a tuberculous husband or wife was examined, 91 were tuberculous, 16 suspect, and 49 negative.[1] If we reduce these figures to percentages, it gives approximately 58 per cent. tuberculous, 10 per cent. suspect, and 32 per cent. negative. Considering solely wives whose husband was first notified, out of 120 cases 66 were tuberculous, 12 suspect, and 42 negative, or 55 per cent., 10 per cent., 35 per cent.; while among husbands of tuberculous wives (36 cases), 25 were tuberculous, 4 suspect, and 7 negative, or 69 per cent., 11 per cent., and 20 per cent. In 15 cases the tuberculous mate first notified has died, and in 7 both husband and wife have died of tuberculosis. Comparing now the results of examining contacts other than husband and wife, we find, out of 1,057 examined, 219 tuberculous, 284 suspect, and 564 negative, or roughly 20 per cent., 27 per cent., and 53 per cent. An attempt to control results by examining contacts of non-tuberculous patients gave, out of 81, 4 tuberculous, 7 suspect, and 70 negative, or 5 per cent., 8 per cent., and 87 per cent. I take the view that the great majority of the mates of tuberculous husbands or wives do sooner or later show signs or develop symptoms of tuberculosis; but I further believe that the great majority of those infected recover, and make a speedier recovery, than most tuberculous patients.

Considering for a moment the question of "assortative" mating among the working class population, with whom my work is mainly concerned, I cannot discover that this factor comes into the question at all. Mating seems to be not so much selective as fortuitous—between the men and women who are most thrown into contact with one another. If a man or woman of a tuberculous type marries I do not find that they usually marry another of the same type. Moreover, by this time, I know most of the markedly tuberculous families in South Devon, and can recollect extremely few cases where two such families have intermarried, as they certainly would frequently have done in out-of-the-way places where there are reasonable opportunities, if this sort of selection were an important factor.

The views held as to conjugal infection have been prejudiced to some extent by the well-known case of Metchnikoff, who married a tuberculous lady, and, though exposed for years to infection, never contracted the disease. This is after all only one case, and it is as unjust to argue from it as it would be to argue about diphtheria antitoxin from

[1] Ward, E.: *Lancet*, October 4, 1919.

the death of the daughter of an early investigator in this field after a first injection.

Infection other than Conjugal.

No one can deny that the individual resistance to tuberculosis varies within wide limits, or, indeed, that there may be families of low resistance, but the main factor in spreading the disease that suggests itself when visiting the homes of tuberculous patients is infection.

The question of direct infection in tuberculosis[1] apart from conjugal cases is more difficult, and would be almost hopeless to attack in any but rural districts. I have attempted to classify the cases investigated into the following groups: (i.) Immediate infection; (ii.) remote infection (in which the patient has been in intimate contact with an infective case, either in early life or at some time separated by an interval of years from the appearance of the first symptoms); (iii.) no traceable infection; and (iv.) doubtful. I find out of 252 cases, 102 appear to be due to immediate infection, 47 to remote, 78 no traceable infection, and 25 doubtful; or, expressed in percentages, we have the following: 40 per cent. I., 19 per cent. R., 31 per cent. O., and 10 per cent. D. A new series of 316 adults gave 43 per cent. I., 14 per cent. R., 36 per cent. O., and 7 per cent. D.

Among 96 children under sixteen I found the following: 74 per cent. I., 2 per cent. R., 23 per cent. O., and 1 per cent. D. Out of 102 non-tuberculous control cases similarly investigated, I found 5 per cent. I., 7 per cent. R., 82 per cent. O., and 6 per cent. D. It is interesting to note that 77 tuberculous soldiers gave the following proportions: 5 per cent. I., 26 per cent. R., 67 per cent. O., and 2 per cent. D. Cases of tuberculosis may be divided ætiologically into those due to (1) childhood infection, which is often untraceable, and which has been rekindled in later life by overwork, illness, poverty, or other debilitating influence; and (2) immediate infection. This may occur at any period of life with sufficient virus to break down the patient's resistance at the time. The first class is for the most part beyond the reach of preventive measures, but may be prevented in time, incidentally, by measures devised to eliminate the second class.

The following cases indicate how tuberculosis is spread. Similar instances could be given by most tuberculosis officers.

(1) An invalided soldier is found with his wife and two young children occupying two rooms. This patient is highly infective and brings up half-a-pint of sputum daily. He is sitting shivering over a fire before which the children are being washed. At his side in the fender is a dry spittoon with sloping sides; at the bottom of the spittoon is dry or drying sputum, on the sides are blobs of sputum, and

[1] Ward, E.: *Lancet*, January 3, 1920.

starred all round the receptacle is more sputum where the patient has made "bad shots" at the spittoon. I was able to get this man a separate bedroom, and a few months later to persuade him to go into a tuberculosis hospital, where he died. When the family were seen again, four months after his death, the wife had been getting thinner, and had physical signs of active disease at both apices, one child was ill with pulmonary and glandular tuberculosis, and the other a suspect. A child born since the husband's death was the only healthy member of the family. Others might interpret this as a case of hereditary predisposition and selective mating, but such an interpretation would seem far-fetched.

(2) On another occasion (March, 1919) I visited a young man of twenty-five in a seven-roomed house with nine inmates. The patient, who has advanced disease, lies in a room adjoining the kitchen, and where the family frequently have their meals. The room is a sitting-room with a bed in it, and in the centre stands a large table. Alongside the patient's bed two or three newspapers are spread as a receptacle for his sputum, the mother informing me that he will use nothing else. Scattered over the paper are lumps of nummular sputum in varying stages of desiccation. On the carpet beyond the papers are a few more nummuli, and on the table-leg there is a mass which has hit the leg high up and trickled downwards some 18 inches. Between the papers and the door, and on into the front room are traces of sputum carried on the feet of visitors.

The patient has since died of tuberculosis, also one sister and a brother; another sister has been in a sanatorium and is now ill in bed. I have not examined all the household yet, as the family consists mainly of adults, and therefore difficult to find in at the same time; but so far all I have seen are tuberculous, including a New Zealander who married a sister of the patient and went to live there. Yet these people were somewhat apathetic and careless about the whole matter.

I have sometimes found a little colony of tuberculous persons in a more or less isolated spot, such as one street of a village, and I am inclined to attribute the existence of such a colony to conditions of infection similar to those described, rather than to the influence of the local climate, or the prevalence of some special wind.

Discussion.

These considerations seem to indicate that the attempt to check tuberculosis should be made by treating it as an infectious disease, dealing first with obvious sources of infection in the home and the factory.[1] These measures would entail no great hardship to in-

[1] Mock, H. E.: "Industrial Medicine and Surgery." London: W. B. Saunders and Co., 1919.

dividuals or any dislocation of society, and we might very well find after their adoption that the infection was becoming less universal, and further means completely to prevent the disease would suggest themselves.

Brownlee's work[1] on types of tuberculosis does not affect the problem appreciably. Most probably the differences he discloses are due to the differing reactions to the disease at different ages, and not to special types of micro-organism. For some years I have noticed that a girl who suffers from active tuberculosis between eighteen and twenty-five may, if she survives, enjoy good health until between forty and fifty, the menopause period, when another breakdown not infrequently occurs. The same phenomenon may be noticed in men. Clinical obsèrvation also shows an earlier period of low resistance up to seven or eight, which is succeeded by a high resistance period up to fourteen or fifteen, which is in turn succeeded by the low resistance period already described. Similar age differences in reaction to disease may be noticed in syphilis. Time has not yet allowed me to work out the tuberculosis periods statistically.

Whether infection by the tubercle bacillus from open cases of human tuberculosis and from bovine sources covers the whole ground cannot yet be said. The question may well prove to be more complicated, and Spengler's "splitter" bodies or some other spore formation may become important, or there may be other quite unsuspected sources of the disease. But the facts already known show clearly the necessity of isolating known sources of bacillary infection, and this has not yet been attempted. When this has been done, the consideration of these further questions will be considerably simplified.

THE SUN TREATMENT OF SURGICAL TUBERCULOSIS.

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Surgical tuberculosis is not, as it was for a long time considered, merely a local disease, requiring local treatment, but also a general disease demanding general treatment. Of all infectious diseases tuberculosis is the one in which the resistance of the organism invaded plays the most important part in securing cure. A rational treatment should therefore aim primarily at building up the resistance of the

[1] Brownlee: Medical Research Council, S.R.S., 46.

body. With regard to local treatment, this is only rational in so far as it contributes to the natural defences of the patient, without in any way diminishing them.

I hold that heliotherapy at a high altitude best fulfils the conditions necessary for the arrest of tuberculosis; it is, in fact, the ideal general treatment, since the sun, combined with pure mountain air, has an exhilarating effect without comparison; the vitality of the organism is raised, and restoration of the wasted tissues facilitated. Heliotherapy

FIG. 1.—THE TREATMENT OF TUBERCULOUS SPINAL CARIES.

General view of one of the balconies at "Les Frênes," Leysin, showing patients resting in the ventral position.

is, moreover, the most effective form of local treatment, for the action of the sun is powerfully analgesic and bactericidal, besides reducing inflammation and promoting cicatrization. In confirmation of the above claims I can offer an experience of seventeen years, which testifies that the sun treatment can cure all forms of surgical tuberculosis in all stages and at all ages. This is particularly the case when the disease is in the closed form—that is to say, when it is not complicated by a secondary infection, the result too often of surgical intervention.

Among the general effects which the sun produces on the organism,

the first place must be given to its action on the skin, the organ of absorption and sensation, of nutrition and of excretion, of which the great physiological importance has been far too long unrecognized. By the simultaneous development of the muscles, heliotherapy returns its lost beauty to the outlines of the body. By protecting to the maximum the integrity of the articular functions it makes the avoidance of irreparable mutilations possible, and enables us to return to normal

FIG. 2.—A CASE OF TUBERCULOUS SPINAL CARIES.

The patient had pronounced angular deformity, paraplegia, and muscular atrophy.

FIG. 3.—AN ARRESTED CASE OF TUBERCULOUS SPINAL CARIES.

The same patient shown in Fig. 2 fifteen months after treatment was commenced. Disappearance of paralysis and correction of curvature, without the use of plaster apparatus. Reconstitution of musculature and of general health.

life individuals well prepared for work, and not maimed and crippled portions of humanity incapable of earning their living. Heliotherapy thus reaches the ideal in the conservative treatment of surgical tuberculosis.

The examination of nearly 12,000 X-ray plates demonstrates beyond a doubt the action of the sun in promoting recalcification and cicatrization in cases of bone infection, however deep-seated or extensive it may be. We can also follow the different steps in the healing of osteo-articular tuberculosis, which in certain cases proceeds as far as complete anatomical and physiological restitution.

It was in 1903 that we opened our first clinic for the exclusive treatment of surgical tuberculosis. This establishment of fifty beds—at present one of our free clinics—soon became insufficient, and we have successively opened thirty-six new clinics specially arranged for the practice of heliotherapy. At the present moment we have a thousand beds at our disposal, enabling us to treat surgical tuberculosis in all classes.

But if heliotherapy can cure tuberculosis, it can also prevent its inception. It is known that tuberculous infection is always taking place, even from infancy, but that it is arrested in the tracheo-bronchial glands if the resistance of the organism be sufficiently strong. It is therefore necessary to place the latter in the best conditions for resistance, and for this purpose nothing could be more effective or more certain than life in the open air and in the sun—those two essential factors for organic growth.

By founding in 1910 our École au Soleil des Noisetiers at Cergnat, near Leysin, we were the first to put into practice this preventive action of the sun. This establishment has the double object of saving from tuberculosis weakly and predisposed children, and, on the other hand, of forming an intermediate stage in which our small convalescents can gradually be prepared for their return to normal life. The results obtained by this École au Soleil have been so conclusive that they have caused us to advocate the widespread establishment of such preventive schools. This preventive action of the sun is perhaps even more important than its therapeutic action, and gives to heliotherapy a social value of primary importance.

X-RAY TREATMENT OF TUBERCULOUS GLANDS.

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SUFFERERS with tuberculous glands may select from at least five alternative methods of treatment: (1) Climatic and dietetic; (2) medicinal; (3) tuberculin; (4) surgical; (5) irradiation. It is the purpose of this paper to deal with the last-named method, but the others should briefly be passed in review in order to appreciate the position of radiology.

The first alternative—climatic and dietetic treatment—can be dis-

missed in a word, since it is in the vast majority of cases inadequate alone, but may be combined with any of the other methods and thereby accelerate recovery. Turning to methods 2 and 3—medicinal and tuberculin—the prognosis when these measures are used alone has been summed up by Rendle Short in his "Index of Prognosis," the article in question being limited entirely to tuberculous glands in the neck. He has collected published statistics of a large number of cases and comes to the conclusion that cures result from non-operative procedures in about 25 per cent. of cases, including those treated by tuberculin. Of the remaining cases 21 per cent. developed pulmonary tuberculosis and 8 per cent. tuberculosis in other parts of the body, though these further areas of infection could not always be said definitely to be caused by spread from the original focus. The same article proceeds to discuss prognosis in cases submitted to operation and finds the figures materially the same, but remarks that the operative cases were on the whole much worse than the non-operative, and concludes from this that surgical removal of the affected glands is of some use in preventing recurrence of the infection but is by no means sure. As regards local recurrence Rendle Short finds the figures of published statistics vary greatly, and considers that the local recurrence rate is on the average between 15 and 20 per cent. The best figures are those of the Mayo Clinic, which give a local recurrence rate of 8·6 per cent. The recurrence rate elsewhere in the body is approximately the same for operative and non-operative methods. No reference is made to treatment by X-rays, and the present writer does not know of any published list of results comprising sufficient cases from which to draw definite conclusions as to percentage of cures; he believes, however, that X-ray treatment efficiently applied will show results superior to those quoted above.

It is advisable in cases undergoing a course of X-ray treatment to combine with it such medicinal or general measures as may be indicated, for by this means the prognosis is considerably improved. Fresh air and good nourishing food should be ordered, and, in particular, the state of the blood should be kept as nearly normal as possible. It has been shown by Knox in cases of malignant disease submitted to irradiation therapy that the response to such treatment is more rapid and more lasting in cases where the red corpuscle count and the hæmoglobin content remain high than in those cases where they are low. If, as some contend, a large proportion of the benefit resulting from X-rays is due to the secondary radiations excited in the tissues, then the hæmoglobin content of the blood becomes of extreme importance, since this is the constituent most likely, by virtue of its iron, to give rise to useful secondary radiations, and therefore any measures directed towards keeping up the hæmoglobin will definitely influence the response to X-ray treatment

in addition to improving prognosis by the better general health resulting from such measures.

It may be asked, What cases of tuberculous glands are suitable for X-ray treatment? and the answer may confidently be given that in no case is it contra-indicated. It may be necessary in some cases to combine operative with radiation treatment, but if so the result will be better than if operative treatment alone is used. If any gland breaks down and suppurates it is obvious that an outlet for the pus must be made, and it is the writer's experience that if efficient X-ray treatment be given before the incision is made a protective barrier will be set up round the broken-down gland, thus allowing the pus to be evacuated through a much smaller opening, and leaving a less objectionable scar than if no irradiation be used: also any scar tissue which may already be present as the result of previous operation or abscess will be softened. Reference to this point will be found later among the case notes.

Another class of case which comes for treatment is that in which discharging sinuses already exist, either following operation or from bursting of a tuberculous abscess by natural means. It sometimes is surprising how rapidly old sinuses may be healed by X-rays, and illustrative cases will be found at the end of this paper.

In considering the action of X-rays on the body one must not lose sight of the fact that the response is both local and general, and may be due both to chemical and biological factors. We know of many chemical changes induced *in vitro* by X-rays and, in fact, make use of one of these changes every time we take a radiograph. The chemical changes induced in the living organism are more complicated and not yet so well known; it is not the purpose of the writer to enter into them at the present time, but probably they exercise a profound influence on the course of the case.

The normal tissues of the body vary greatly in their susceptibility to irradiation, the lymphoid and glandular structures exhibiting a much greater response than any other tissues. In general it may be stated that young and actively growing cells are much more influenced than are those which have become mature and reached their fixed state. To this, in part, is due the selective action of X-rays. Experiments by Perthes illustrated the effect of X-rays on actively dividing cells. He irradiated developing ascaris ova, and found considerable retardation of development in those submitted to radiation when compared with control specimens which had not been irradiated. The dosage, however, was considerably in excess of that used therapeutically. Laboratory cultures of organisms also seem to require larger doses than are usually used therapeutically before they show any material change. But it must not be forgotten that the action of

X-rays is not entirely limited to their inhibitory action on the infected focus; they stimulate the surrounding healthy cells and the blood to resist the influence of the invading organism.

In small doses the action of X-rays is stimulant; in large doses it is destructive, and great caution must be exercised lest healthy tissues be damaged in an attempt to destroy an infected focus. The effect of a dose may vary from slight transient erythema of the skin surface to a deep and spreading ulceration in the case of greatly excessive over-dosage. In the smaller doses formation of anti-toxins is stimulated, and these not only act locally, but are carried by the blood-stream to all parts of the body, there to exercise their beneficial influence. Cases are on record in which lesions far removed from the irradiated area have cleared up during the course of treatment.

The response of enlarged glands to treatment varies widely according to the cause of the enlargement. Simple inflammatory glands respond very rapidly unless pus be present. Lymphadenoma reacts rapidly, but shows a marked tendency to recurrence. Sarcomatous glands diminish in size much more rapidly than carcinomatous. Tuberculous glands usually react fairly slowly, but do not show the tendency to enlarge again which is seen in lymphadenoma.

The common position in which we find tuberculous glands is the neck, and we must remember that in the vast majority of cases the infection is not pure, but is complicated by various septic organisms derived from the mouth or other areas drained by the lymph vessels of this chain. This explains the different response to treatment observed in different cases, and even in the same case the proportions of the various infections in different glands may not be the same. In some cases which come for treatment with many glands enlarged all of them disappear, except one which resists treatment, and may either remain enlarged and hard or break down and suppurate, whilst the others clear up normally. Examples of this will be found amongst the case reports.

In prescribing the details of a course of treatment there are several points to be borne in mind. Chief amongst them are the nature of the ray to be used, the degree of filtration, the size of the dose, and the intervals between doses. It is not sufficient merely to say "X-ray treatment," but attention must be paid to details if success is to be attained. Brief comments on these points may be made here.

The Nature of the Ray.

X-rays are ether vibrations analogous to light-rays, but of much shorter wave length and correspondingly higher frequency of vibration. The rays of short length and high frequency are called hard, and are more penetrating than the rays of greater length and lower frequency, which we call soft. The hard rays are used for treating deeper lesions,

whilst the soft ones are useful for cutaneous affections. The great difference between these extremes will best be appreciated by comparison with light-rays. The range of X-rays which we use in medicine extends over considerably more than an octave; that is to say, the soft rays have more than double the wave length of the hard rays. In the case of light the interval between the extreme red and violet ends of the visible spectrum is less than an octave, so that the range of X-rays which we use is considerably greater than that included in the entire visible spectrum of light.

The Effect of Filtration.

A beam of X-rays passing through any material suffers partial absorption, with the result that the emergent beam is less powerful than the incident. The softer rays are absorbed to a greater extent than the harder, so that the average hardness of a heterogeneous beam, such as is emitted by an X-ray tube, is increased by passing through any material. We make use of this fact in treatment by causing the beam of rays to pass through such a filtering material as aluminium before reaching the patient. By this means we cut out the softer rays in proportion varying with the thickness of our filter, and thus enable larger doses to be given to the deeper tissues of the patient. It must be remembered that the limit of dosage which we can give is determined by the skin reaction provoked in the patient, and the soft rays give a more intense skin reaction than do the hard ones; at the same time the soft rays are so much absorbed in the more superficial tissues that they do not reach the deeper structures in quantity sufficient to give us the effect we desire. On both of these grounds we filter out the soft rays when treating the deeper structures. Details will be found in the case notes as to the degree of filtration used.

The profound influence exercised by the quality of the ray and the degree of filtration on the dose received by the deeper tissues was shown by experiments of Guilleminot. A single example taken from his experiments will suffice to show the importance of these points. By varying the quality of the ray, without using any filter, the tissues at a depth of 3 centimetres from the skin surface could be made to receive from 13 to 42 per cent. of the skin dose, and then, by introducing filters of aluminium up to 5 millimetres thick, the percentage rose to 67—in other words, the dose received at this depth with hard filtered rays was more than five times that given when soft unfiltered rays were used, the skin dose in each case being the same.

The Size and Frequency of the Dose.

These can only be determined for each case individually. Broadly speaking, we may give large doses at intervals of about three weeks,

or smaller doses at shorter intervals. Some cases do better on one method and some on the other. Both are included in the case reports.

CASE 1.—Female, aged thirty-five. Enlarged glands in both sides of neck. Duration: Some years. Treatment: Doses of medium size; intervals between doses a fortnight; filtration, 3 millimetres of aluminium. Eleven doses given to right side and twelve to left side. Glands not palpable at end of treatment.

CASE 2.—Female, aged twenty-one. Enlarged glands in right side of neck, anterior and posterior. Duration: Two years. Sometimes a dull aching and dyspnœa on exertion. Glands hard and freely mobile. Treatment: Three-quarters of a full dose given through 3 millimetres of aluminium at each sitting alternately to anterior and posterior triangle. One sitting each week, so that each area was treated once a fortnight. Twelve doses in all were given, and the glands had entirely disappeared at the end of the course.

CASE 3.—Male, aged twenty-six. Masses of enlarged glands in each side of neck and under chin. Glands enlarged in both anterior and posterior triangles, also one in the right axilla. All glands mobile on palpation. Duration: Three and a half years. Treatment: In all thirty-four doses were given. Each was just a full dose, and was filtered through 3 millimetres of aluminium. Different areas were treated at each sitting, and it was arranged that no area was irradiated at intervals of less than a fortnight and sometimes three weeks. At the end of the course all glands had entirely disappeared, except one which remained just palpable under the chin after considerably diminishing in size. It had been stationary for some time, and gave rise to no symptoms. In this case the glands responded to treatment very well. Even that under the chin became much smaller, but could not be cured entirely. If this had caused any trouble it could have been removed surgically after irradiation quite easily, as it was by this time small, hard, and freely mobile.

CASE 4.—Female, aged twenty-eight. Several enlarged glands around the angle of the right lower jaw. Old operation scar in this region, discharging sinus below and behind the scar. Right posterior cervical glands also enlarged. Treatment: Fifteen doses given at weekly intervals, each dose slightly over half the maximum; filtration, 3½ millimetres of aluminium. At end of treatment sinus had been soundly healed for several weeks, and all glands had entirely disappeared except a single small discrete one, which apparently was inactive. This case illustrates healing of a sinus under treatment and persistence of one gland, whilst all the others disappeared.

CASE 5.—Male, aged eight. Enlarged glands in both sides of neck. Treatment: Fairly full doses at intervals sometimes of a fortnight and sometimes three weeks; filtration, 5 millimetres of aluminium. Six doses given to each side of neck. At end of treatment glands were scarcely palpable, and there had been no recurrence nine months later. This case reacted rapidly to treatment, and there was no breaking down, though children as a general rule show much greater tendency to suppuration than do adults.

CASE 6.—Female, aged nineteen. Enlarged glands in right side of neck. Treatment: At first very small, lightly filtered doses were given, and of these nineteen were administered during a period of fourteen months. Following this the dose and filtration were increased, and a further seven doses given. At the end of treatment the glands were markedly reduced in size, but had not entirely disappeared. When seen again eight months later the condition was unchanged. This case illustrates a type of gland more resistant to the rays, and success was not complete, but the condition was much improved.

CASE 7.—Female, aged seventeen. Enlarged glands in left side of neck; had an operation six weeks ago, but several enlarged glands still present. Treatment: Fairly full doses at intervals of three weeks; filtration, 3½ millimetres of aluminium. Eight doses given. Seen six months after end of treatment, when only one very small and discrete gland was palpable. This case illustrates irradiation following operation clearing up glands which had not been removed.

CASE 8.—Female, aged twenty-nine. Enlarged glands in left side of neck.

There was a very long history in this case. The glands had been enlarged since childhood. Six years ago the tonsils were removed. Whilst doing V.A.D. work she contracted a septic skin condition on her hands, for which she had about twenty injections of colloidal manganese. The skin condition improved, but the glands became further enlarged. Radiographic examination showed calcified glands in each side of the neck, more numerous on the left side, also calcareous areas in the upper lobes of the lungs, especially on the left side. When first seen it was apparent that one gland just under the lower margin of the jaw would break down, and it was decided to direct treatment towards building up a barrier round this gland, so that it might be opened by a small puncture. After five moderate doses at weekly intervals through a 3-millimetre filter of aluminium this puncture was made and pus evacuated. The dose was now increased and seven further applications given, supplemented by three applications of high-frequency effleuve. At the end of the course the sinus was healed, and the glands only just palpable. The scar of the puncture was barely visible. This case illustrates several points—building up a barrier round a breaking-down gland, opening by small puncture, healing of the sinus, and minimal scar formation. It was not possible to render the glands totally impalpable since many of them were already calcified.

CASE 9.—Female, aged fifteen. This case is not one of tuberculous glands, but it illustrates the healing of a sinus under X-rays. A tuberculous abscess had been opened in the buttock, and the patient came for treatment with two discharging openings. After five small doses at weekly intervals through a 5-millimetre filter the wounds had entirely healed.

CASE 10.—Male, aged forty-four. This case again illustrates healing of tuberculous sinuses. It was a case of tuberculous lumbar vertebræ. A lumbar abscess formed, and was aspirated twice; following this an Allbee graft was inserted, after which the abscess was twice more aspirated, and finally burst. The patient came for treatment with discharging sinuses. Very small, heavily filtered doses were given twice a week until twenty-one doses had been administered. At the end of this course the sinuses were healed, and remained healed two months later, the patient at this time being able to walk fairly well.

It would be possible to multiply cases *ad nauseam*, but sufficient has been said to indicate the position occupied by radiology in the treatment of tuberculous glands and sinuses. It is not contended that X-rays are invariably successful, but a large proportion of cases derive considerable benefit, and many are entirely cured. As irradiation does not prevent operation being performed subsequently, and, indeed, often renders such operation more easy of performance, it appears to the writer that X-rays should be tried before resorting to the very wide dissection and extensive scarring which operation entails. In the case reports no attempt has been made to select only cases which were entirely favourable, but to portray cases of each type.

THE ORGANIZATION AND ADMINISTRATION OF A PUBLIC TUBERCULOSIS SERVICE.

By F. J. C. BLACKMORE,

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Tuberculosis Officer for the Borough of Woolwich.

A TUBERCULOSIS service which will deal adequately with the problem has yet to be established in this country, though certain measures have been generally adopted since the Astor Committee reported in 1912. Why has not the existing system produced the hoped for results? It must first be admitted that the conditions have been unfavourable for success. Sanatorium benefit was introduced when there were very few tuberculosis dispensaries, and a very inadequate number of institutional beds available. Efforts to remedy this unfortunate state of affairs were delayed, and measures generally were seriously handicapped by the outbreak of war, and though to-day the system of dispensaries is practically complete, there is still a lack of suitable sanatorium accommodation.

The alleged failure of sanatorium treatment can, I think, be largely attributed to the strain on such beds as have been available, with the consequent curtailment of the period during which the patient should have been retained. The want of hospital beds has accentuated the difficulty inasmuch as the moderately advanced patient has been admitted to institutions which should have been reserved for the strictly early case. Some of the recent statistics on the results of sanatorium treatment would have had an added value had information been given as to the duration of treatment. Even as late as the present year I find that of forty-one patients coming under my observation who have been discharged from institutions, sixteen have left without completing the prescribed period of treatment; of the remaining twenty-five one was discharged as non-tuberculous, leaving twenty-four who actually completed the period of treatment granted. Of these three only were discharged as fit to return to ordinary work; eleven were said to be fit for light work only, and ten were stated to be unfit for any work. In two cases only did the period of sanatorium treatment exceed five months in length. Obviously such of these patients as had dependents were obliged to return to work before being fit in order to provide for the needs of their families. I would suggest that it is not sanatorium treatment which has failed, but rather the methods of administering such treatment. In future it would also appear advisable that whilst at a sanatorium the patient should begin to study and work at such industries as he will be employed on at a colony or at the local work-

shops hereafter mentioned as being necessary adjuncts to dispensary work.

Tuberculosis dispensaries have not as yet taken their proper place in a tuberculosis scheme. There has been a tendency to leave undone certain definite functions, and to undertake other functions which do not belong to the dispensary. There are several causes for this state of affairs. In many places there is no definite system by which patients come to the dispensary, and any resident is allowed to present him or herself or children for examination by the tuberculosis officer. Advantage of this has been taken by a certain section of the population who delight in getting something for nothing, and who come to the dispensary though they have no suspicions of tuberculosis. This results in the dispensary becoming overloaded with patients, with the inevitable consequence that the tuberculosis officer is unable to devote sufficient time to examination and diagnosis of each individual case and defers them for observation from week to week. I have known patients attend at a dispensary who have never consulted a doctor for two years previously. Some dispensaries require that each patient shall be sent by a local practitioner or some definite agency dealing with the health of the public. This has its advantages, and, provided co-ordination were thoroughly established between the dispensary and these other agencies, might work well. In the meantime it would seem reasonable to ask that patients should have at least seen a medical man during the preceding three months. Adequate staffing of dispensaries is essential, and though it has been recently suggested that one doctor and one nurse to each 160 deaths of the population are sufficient, I think there are few tuberculosis officers who will agree with this scale. Clerical assistance in addition is mentioned, but a clerk does not quite meet the case, as if a nurse is to be thoroughly conversant with what is going on she must keep her own "visits record," "street index," "contact" book, and put away all case papers, and write up all deaths and patients discharged from further attendance. In practice it will generally be found that a dispensary nurse is only able to do two hours' visiting per diem, as the afternoons or evenings are devoted to attendance of patients at the dispensary. On this basis a nurse who knows her patients and district thoroughly can only cope with 300 to 350 patients. The ideal at which the nurse should aim is that of knowing every patient and his circumstances so well that she can recall these as she passes through each street. If, however, there be a really good voluntary or other committee working in connection with the dispensary fewer visits by the nurses would be required. Visits up to the above standard have not been possible as yet owing to the war and the scarcity of nurses and health visitors. Many patients failed to attend during the war or moved away into other districts, so that it is probably

difficult at present to find a dispensary where the actual number of active or quiescent cases in the district is known. Yet this number should be known to every tuberculosis officer if he is to have a really comprehensive knowledge of tuberculosis in his locality.

The successful visiting nurse is a *rara avis*, and the qualifications needed for this work are of very high order. The tuberculosis officer must of necessity rely a great deal on the work of the dispensary nurses, and, if these fail, dispensary work suffers enormously. It is therefore necessary that the best type of nurse with brain and initiative be attracted to this service, and the remuneration offered must be adequate to secure them.

Tuberculosis officers who have hitherto undertaken the treatment of certain cases recommended for domiciliary treatment will doubtless now find that the heavy strain born by practitioners during the war having ceased, the latter will be able to give more time and attention to this class of patient, and thus there should be no necessity for this work to be done at the dispensary; but the tuberculosis officer will still need to see these patients quarterly, and communicate frequently with the doctor in attendance.

There seems to be an undoubted tendency to increase the number of forms required from the tuberculosis officer—a tendency which should be repressed, as the clerical work which must necessarily be attended to by him already makes serious inroads upon his time. If, in addition, sufficient attention be given to laboratory work and visiting, the time and attention devoted to patients must suffer.

Apart from conditions which have been largely unavoidable the most striking thing about the existing measures is the lack of co-ordination which exists. We have approximately 360 tuberculosis officers scattered throughout the kingdom, who work largely in water-tight compartments. These officials are clinically independent of control by local authorities, which is as it should be; but they should be linked together for "team-work" purposes by some more central authority, such as a department of the Ministry of Health acting in consultation with its Research Committee and Consultative Council on Tuberculosis. The Ministry has never yet called these tuberculosis officers together for a conference, and such information as is gained by means of Form R and very occasional visits from a medical inspector can only be very inadequate. Our sanatoriums and hospitals also suffer from the same want of co-ordination, as a large number do not appear to accept, in any great measure, a common ground of procedure. Admitting that a very great deal must be left to the initiative of medical superintendents, there still remains much which can be made more uniform.

The Research Committee should include, in addition to bacteri-

ologists, biochemists, and statisticians, one or more persons who have a wide knowledge of tuberculosis as a whole, and this committee should make much greater use of the tuberculosis officers and the statistics and information which they are constantly collecting. A Research Committee utilizing these officials as a "team" could get the most valuable information on almost any point in the problem.

The Research Committee might usefully circulate information as to the value or otherwise of certain kinds of treatment. For example, it should now be possible to form a useful opinion as to the benefit of pneumothorax induction and the type of patient likely to be benefited. On the one hand, we have one authority stating that in early cases "he would rather have a pneumothorax apparatus than a sanatorium" and urging the usefulness of this procedure in 20 per cent. of patients, and others who suggest that its main benefit is in cases with hæmoptysis, and others again suggesting that the more advanced case is most likely to benefit. Considering the number of patients already treated by this means it should be possible to come to some more definite conclusion. Again, a large number of patients have been treated by the intensive-iodine method, and a Research Committee which would investigate the results and circulate to tuberculosis officers information on this and other methods of treatment would be most valuable.

We have no common ground of classification which can be said to be at all accurate, or which will enable results from different centres to be at all comparable. The personal equation is a serious source of error in the Turban-Gerhart System, and must probably enter into almost any system, but it is surely possible to find one which will reduce it to a minimum.

If we adopt the Complete Tuberculosis Scheme suggested by the League of Red Cross Societies at Cannes, April, 1919, its success or failure will depend very largely on how far co-ordination is carried out, and to secure this necessary factor in this country the following needs must be met:

i. A Tuberculosis Department of the Ministry of Health which *shall* confer with (ii.) a Consultative Council on Tuberculosis, which should include a representative number of medical officers of health and tuberculosis officers. This Council would from time to time have joint meetings with (iii.) a Research Committee representative of the different aspects of clinical and administrative tuberculosis. (iv.) The closest liaison between the medical officer of health and the tuberculosis officer, whether the latter be in charge of a sub-department of public health administration or an independent officer. The relationship of these two officials has been a matter of some controversy, but given a more liberal interpretation of the Public Health (Tuberculosis) Regulations, 1912, or, if necessary, an amendment of these regulations, the

advantage probably rests with the independent official, under necessary safeguards from the Ministry as to his efficiency and liaison work with the administrative officer. (v.) Co-operation between the tuberculosis officer and the factory inspector. If the former be given a right of entry into any factory he could investigate personally the conditions under which certain of his tuberculosis patients are working and mixing with other employees. Too little importance has been attached to this side of preventive work. (vi.) Efficient care and after-care of patients. There is perhaps no side of tuberculosis work which presents greater difficulties than this. The problem is many sided, as we have different classes of patients to consider, namely: (1) The insured and uninsured male who must earn his own livelihood and in many cases support a family. (2) The insured female. (3) The uninsured female, in many cases the mother of a family. (4) The children.

Many persons in *Class* 1 are at present unable to enter institutions, as during illness the insurance benefit is the only financial help they have, and this is quite inadequate to support a wife and family. In some cases the wife is able, owing to the age of her children, to go out to work during her husband's absence. In others the necessary assistance can only come from some outside source, whether voluntary or by means of a State grant. The after-care of these tuberculous patients must consist largely in seeing that they are provided with suitable work and for such hours as they can beneficially perform the same; the solution here appears to be the organization of suitable industries and workshops, which must be linked up with the dispensaries and sanatoriums under medical supervision. The gap which now exists between the discharge from a sanatorium and the return to full work is one which is undoing half the work accomplished by these institutions. At present it would seem that more attention is being paid to colonies which can only serve a small proportion of our tuberculosis patients. The provision of such workshops connected with the dispensaries should not be left to private and voluntary, effort entirely as they must be closely co-ordinated with the sanatorium which serves each district. *Class* 2, the insured female, presents much the same difficulty, though here a larger number may possibly be able to give up work for a longer period and so enable the working capacity to be more completely restored. *Class* 3. Mothers of families present a difficulty in this class —a difficulty which might conceivably be met by giving them periodic holidays in a convalescent home reserved especially for tuberculosis patients in the quiescent stage. *Class* 4. The needs of the children can be very largely met by the increased provision of open-air schools both for the post-sanatorium case and those whose disease is quiescent or latent.

Without some such co-ordination of tuberculosis service as outlined above it must inevitably happen that a large proportion of the money now expended on this work will prove unremunerative.

AN IMPRESSION OF THE LIVERPOOL TUBERCULOSIS CONFERENCE.

By B. T. J. GLOVER,
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The Eighth Annual Conference of the National Association for the Prevention of Tuberculosis was held in St. George's Hall, Liverpool, October 7 to 9, 1920.

It appears to be a matter of difficulty for the general public to understand that there is no real difference of opinion between medical men as to the relative importance of the many methods that are advocated from time to time as a means of preventing or treating tuberculosis. The opinion was freely expressed by delegates to the Tuberculosis Conference that in the face of so many diverse views expressed by medical experts there must obviously be much difference of opinion between them. This disagreement is more apparent than real, and doubtless the medical profession is very considerably to blame for not recognizing this misunderstanding and taking steps to overcome it. There is no royal road to success in either the treatment or prevention of tuberculosis. It must be clearly recognized that the many methods advocated and employed are equally useful, and all lead, by devious paths perhaps, to the same goal. When a number of medical experts read papers and each in turn advocates some special procedure, it is never intended that such advocacy should imply the exclusion of all other means. In prevention to-day we have many factors to consider. There is a need for proper housing accommodation, adequate food, proper clothing, the isolation of infectious cases, the treatment of the sick as a means of preventing cross infection, financial assistance to patients and their dependents, and a host of other factors exhaustively dealt with in the many papers at the Conference, and it has been most unfortunately assumed by many delegates that because one speaker emphasized the vital importance of the building of proper housing accommodation, and another speaker devoted his entire attention to the urgent need for a non-tuberculous milk-supply, then these two experts were in disagreement as to the procedure which should be adopted to diminish the prevalence of tuberculosis. It cannot be too clearly understood that in the absence of a specific remedy which will render all present methods of treatment obsolete, and in the absence of any one method of prevention which will not only block all avenues of infection but will also suit the tastes of all people, we are compelled to employ many methods of both general and specific importance in treatment and in prevention. It is impossible to place these methods in the order of their importance. There is no order of importance. We are winding a chain round this disease, and every link is important.

The country which will succeed best in this campaign is the one that is not only prepared to use every known method of treatment or prevention to the exclusion of none, but is also prepared to spend the most money upon each one of them. A view was heard on many sides that research was needed to end this conflict of opinion. Research is needed most urgently to enable us to proceed to better advantage, but in the absence of any further knowledge gained by research there need be no hesitation in proceeding energetically at once, utilizing all the methods which are at our disposal now. It will not be waste of time and money to build more sanatoria, in spite of the fact that they will not, and never could alone, solve the problem of tuberculosis, nor will it be waste of time and money to build decent houses, rid ourselves of tuberculous cattle, improve the general health of the community, provide medical treatment, help patients in food and money and so on; and it is as certain as anything can be that to continue to work as we are doing at present will greatly reduce the incidence of the disease. By all means let us look for new methods and improvements in old methods, but at the same time let it be understood that new methods will not replace old ones, but will merely be added to them.

There was another criticism on the part of the delegates worthy of some consideration—namely, that the medical speakers had "let too many cats out of the bag." If medicine is worthy of being regarded as a science—and some day it may be an exact science—it has nothing to fear from frank discussion with the attendant confession of failures relieved by occasional successes. If the help of the general public is to be an important factor in success—and I for one cannot conceive success without their help—then all the cards must be laid upon the table, and the knowledge that we have must be completely open. Exaggerated claims for one method compared with another succeed in establishing themselves by semi-secrecy. A frank expression of views can do nothing but good, provided that the diversity of views expressed is not misinterpreted as disagreement, and a conference is the proper place to express them. One could not help feeling that there is little new knowledge available. It was equally obvious that there is a great deal of knowledge already acquired of great value. What is wanted to-day is the energy and money to apply what we know in the many ways experience has shown to be profitable, and not to take the pessimistic view that no progress is being made, and no progress can be made, until increased knowledge is available. The history of the last fifty years shows what has been done to lessen the incidence of tuberculosis with general sanitary measures alone, without the added knowledge and the more specialized methods at our disposal to-day.

There is no call to consider here the papers read and the various discussions. Records of all these will, doubtless, appear in the volume of transactions which it is understood is in preparation.

ASSOCIATIONS AND INSTITUTIONS.

THE DELAMERE TRAINING COLONY.[1]

THIS new colony has been established in association with the Liverpool Sanatorium, Delamere Forest, Frodsham. The committee of the joint institutions purchased a farm of about 250 acres of arable land, adjoining the site of the sanatorium, and through the munificence of a private donor a colony for the training of twenty discharged tuberculous ex-service men was erected, consisting of a large dormitory block with ten (two bed-) rooms, and the necessary lavatory and sanitary accommodation. Connected with this by a covered corridor is a block containing a billiard-room, workshop, stores, cloak-room, and drying-chamber, with heating chamber in a basement, and the upper floor forming a self-contained flat for a married instructor; the whole being built in brick cavity walls, cement and pebble-dashed exterior and the interior finished in Keene's cement. This portion of the colony has been in full occupation for the past two months, and the results have so far proved so satisfactory that an extension by the Ministry of Health to accommodate a further forty colonists has been agreed to, and is in course of construction. The present workshops will be used as day-rooms, with the billiard-room, etc, for the patients, and the new accommodation will take the form of two blocks of dormitories to accommodate forty beds, a block of resident quarters for unmarried staff, with the usual sanitary accommodation, dining-hall, and a range of workshops for the trades taught. Colonists are chosen from ex-service men whose condition is due to service, preference being given to Lancashire and Cheshire residents. Applicants must have undergone a course of treatment in a sanatorium and the medical report with recommendation from the medical superintendent of the applicant's sanatorium is the only examination necessary. Quiescent cases are selected, and the man's suitability for training from a moral and intellectual standpoint is the most important factor. The scheme is to give every man an intensive course of training in a suitable trade, so that he will be fitted to earn a livelihood in a village or our Colonies under satisfactory conditions after discharge, and where there is a prospect of home employment without much cost in equipment. Each patient must learn and take part in allotment work, separate allotments being given to each. To encourage them, all the produce from these allotments is the patient's own property, and can be sent home or given to friends. In addition, some trade is taught—*e.g.*, market-gardening, poultry-farming, forestry, watch and clock repairing, and rural handicrafts. For market-gardening and poultry-farming an area of ten acres has been allotted; three acres are being planted, under the supervision

[1] We are indebted for the above account of the Delamere Training Colony to Dr. Alfred Adams, the Medical Superintendent.—EDITOR, *B J.T.*

and co-operation of the Cheshire County Council and their experts, as an experimental orchard; three acres market-gardening; three acres poultry-farming; and one acre for the men's allotments. It is the intention to carry on intensive cultivation on the latest principles, and for this purpose the site is eminently suitable. Forestry is taught by arrangement with the Crown Authorities, the men being instructed in the Delamere Forest by the forest officials. The clock and watch repairing class at present consists of seven members, who are rapidly acquiring the elements and handicraft of the trade under a fully qualified instructor, and the progress made by the class is most gratifying. Every appliance used in up-to-date workshops is supplied, and the learners are taught to use lathes, mandrils, turns, and are instructed in the making of parts. So keen is the interest taken in the work that the men frequently return to the shop after working-hours and on Saturday afternoons to work on watches, etc., of their own or their friends. The rural handicraft class is in course of formation, and it is intended to teach the men simple joinery and general repairs, so that they will be able to execute repairs on farm implements and buildings, and general jobbing. It is hoped to construct poultry-houses for the use of the poultry-farm and for sale, so that the general repairs and upkeep of the colony and sanatorium will be also undertaken. Further extensions will be made as the demand arises and numbers increase. A highly-skilled instructor has taken over this department, and workshops fitted with the latest labour-saving machines are being installed. So far the experiment has been an unqualified success, and the keen interest taken by the Colonists in their lectures and work augurs well for the future. The placing of these men in a suitable environment after leaving is at present under consideration. Certain of them can be guaranteed work in the colonies, and it is hoped each will leave with the necessary equipment of tools, etc., to enable him to carry on. At present so much educational work is being done that no profits accrue from the work, but as the standard of work improves the profits, after paying for materials, will be placed in a fund to pay the men a bounty on leaving, and to assist in establishing them.

Colonies for ex-service men and civilians are now being planned, or are in course of development, in various parts of Great Britain and in British lands overseas. Some of these are aiming mainly at training in agricultural or horticultural and allied interests, while others are giving special attention to instruction in handicrafts. We shall be glad to publish particulars regarding these interesting experiments if medical superintendents will be good enough to forward information in a condensed form.

NOTICES OF BOOKS.

THE PROBLEM OF TUBERCULOUS INFECTION.[1]

CALMETTE, among living exponents of the tuberculosis problem, holds the premier place, and his recently-issued volume is truly an *opus magnum*. No student of tuberculosis can afford to neglect this monumental volume. It is the most complete, explicit, up-to-date, and helpful presentation of fundamental facts and guiding principles relating to the development of tuberculosis in man and animals. And yet all is set forth simply, in logical order and with rare clarity. Although Calmette has definite views respecting many questions which others hold to be still *sub judice*, his own conclusions are presented with a sound scientific respect for the laws of evidence and a proper regard for the opinions and experiments of investigators not in accord with his own beliefs. After a concise historical introduction comes the main substance of the volume grouped in four parts: the first deals with the characteristics of the tubercle bacillus and the results of its action as an infective agent; the second records the results of experimental work in producing tuberculous infection in animals; the third enumerates details of the processes of defence and diagnostic methods; while the fourth is given up to a discussion of natural and acquired immunity. Calmette still holds that tuberculosis depends essentially on an infection of lymphatic elements, and he believes that the usual channel of invasion is through the alimentary tract. One of the most interesting sections of this fascinating work is that which deals with tuberculosis in infancy and childhood. The facts and views here presented point the surest road to practical ways and means whereby tuberculosis may be prevented and arrested. Calmette's volume is comprehensive, and draws its evidence from all fields; it is a reference work which both medical and veterinary workers will find indispensable. It not only appeals to the pure pathologist, but furnishes sure foundations for the service of medical advisers directing efforts to protect public health, as well as those who strive to safeguard and restore human subjects and animals. The book deserves to be read by all medical, sanitary, veterinary, and social workers, and it can also be commended to the consideration of all thoughtful students of biological and pathological problems. The volume is illustrated with exquisite coloured plates, and in all respects is a notable production. Although there is a good table of contents, it is to be regretted that there is no index.

THE TUBERCULOSIS WORKER.[2]

In the campaign against tuberculosis there is need not only for the full-time, highly-trained regular, but also for the part-time, common-

[1] "L'Infection Bacillaire et la Tuberculose chez l'Homme et chez les Animaux: Processus d'Infection et de Défense; Étude Biologique et Expérimentale." Par A. Calmette. Pp. vi+619, avec 31 figures dans la texte et 25 planches hors texte en couleurs. Paris: Masson et Cie, 120, Boulevard Saint-Germain. 1920. Prix: 55 francs.

[2] "Handbook for Tuberculosis Workers." By Noel Bardswell, M.V.O., M.D., F.R.C.P., Principal Assistant Medical Officer, Public Health Department, London County Council. Pp. iv+66. London: John Bale, Sons, and Danielsson, Ltd., 83-91, Great Titchfield Street, Oxford Street, W. 1. 1920. Price 1s. 6d. net.

sensed, tactful, understanding volunteer. But the voluntary worker must know his duties and realize his limitations. Dr. Noel Bardswell has provided an admirable little handbook for tuberculosis workers. In it he sets out in clear-cut sections and lucid sentences just the information and direction regarding tuberculosis which social service and welfare workers should digest and be able to impart to those they are supposed to influence and advise aright. The manual has been written by an expert experienced not only in sanatorium management and the training of tuberculosis officers and nurses, but also in the care of tuberculous patients and those who seek to serve their interests. The brochure is full of helpful information, with suggestions and hints which the open-minded worker will readily appreciate. A brief but excellent section on the care of children suffering with non-pulmonary tuberculosis is provided by Sir Henry Gauvain. There is also a list of centres where the voluntary worker may receive systematic training.

MANUALS FOR MEDICAL ADVISERS AND WORKS OF REFERENCE.

Tuberculosis has become such a speciality that tuberculosis officers, medical superintendents of sanatoria, and other medical advisers dealing almost exclusively with tuberculous subjects are in danger of neglecting the study and claims of medical science generally. In dealing with such a department of social medicine as tuberculosis it is essential that all concerned with the organization and administration of tuberculosis work and the care of tuberculous patients should make a point of keeping themselves acquainted with all forms of medical progress. As a means for refreshing the memory in the essential facts of medicine, we would advise a study of the new edition of "Wheeler's Handbook of Medicine."[1] This compact, comprehensive, and serviceable manual was first issued in 1894, and after passing through several editions, and having been reprinted many times, is now in its sixth edition. It has been thoroughly revised by Dr. W. R. Jack, and a number of new articles have been added. There is also an excellent section on Medical Diseases of the War.

"Clinical Methods," by Hutchison and Rainy, is another work which every medical practitioner should keep within reach and read once a year.[2] A new and serviceable edition of this most compact and helpful guide to the practical study of medicine has just been published. The work first appeared in 1897, and has passed through several editions and undergone numerous reprintings. It is now so well known and widely used that it may justly be counted as beyond the reach of a reviewer's praise. We desire, however, to direct attention to the appearance of the new edition, which has undergone thorough revision and been brought up to date in all its sections. Special additions have

[1] "Wheeler's Handbook of Medicine." By William R. Jack, B.Sc., M.D., F.R.F.P.S.G., Physician to the Glasgow Royal Infirmary and Lecturer in Clinical Medicine in the University of Glasgow. Sixth edition. Pp. xv+561. Edinburgh: E. and S. Livingstone, 17, Teviot Place. 1920. Price 12s. 6d. net.

[2] "Clinical Methods: A Guide to the Practical Study of Medicine." By Robert Hutchison, M.D., F.R.C.P., and Harry Rainy, M.D., F.R.C.P.E., F.R.S.E. Seventh edition, revised throughout. Pp. xiii+685, with 16 coloured plates and 157 figures in the text. London: Cassell and Co., Ltd. 1920. Price 12s. 6d. net.

been made to the chapters dealing with the examination of the heart and of the urine. New colour plates have been provided and a series of typical electrocardiograms. The section dealing with the investigation of the respiratory system and examination of the sputum is particularly serviceable. The volume is equipped with an admirable index.

A thoroughly practical manual on physical signs to be noted in the examination of the chest and abdomen has recently been issued by Dr. A. J. Jex-Blake.[1] It has been prepared to meet the requirements of medical students and practitioners desirous of guidance in the recognition of signs met with both in health and disease, and their right interpretation. The manual provides an excellent scheme, and although containing no special novelties, offers the chief facts and sound explanations in a way which can readily be understood. The first part of the handbook describes the methods of examining the chest by means of inspection, palpation, percussion, and auscultation; the second describes the principal signs to be looked for in connection with the chief diseases of lungs, mediastinum, and heart; the third describes the examination of the abdomen and the diagnosis of abdominal swellings. The volume also contains useful accounts of the use of the sphygmomanometer, polygraph, electrocardiograph, and X-rays in diagnosis. Dr. Jex-Blake's manual is to be warmly recommended as an excellent introduction to the science and art of medical diagnosis.

Graduates of medicine desirous of taking up tuberculosis work or devoting themselves to public health services should make a point of securing their D.P.H. at as early a date in their career as may be possible. Dr. David McKail has written a serviceable handbook providing all essential information regarding chemistry and bacteriology in its application to public health.[2] The manual is based on the author's notes prepared for candidates in training for the D.P.H. The book is intended to serve as a supplement to actual laboratory teaching, and as such is to be strongly recommended. There is an excellent section on the tubercle bacillus, its toxins, and the chief forms of tuberculin. The appendix contains a description of bovine and human types of tubercle bacilli.

Reference must here be made to the appearance of a fourth edition of Dr. W. Langdon Brown's very able and yet thoroughly practical work on the application of "Physiological Principles in Medical Treatment."[3] It is a work which should be in the hands of every medical adviser, and senior students desirous of guidance in regard to the application of the teachings of physiology to the practice of medicine will find it full of enlightenment. It is an excellent introduction to much

[1] "Physical Signs in the Chest and Abdomen." By A. J. Jex-Blake, M.A., M.D., F.R.C.P., Physician to St. George's Hospital and Assistant Physician to the Hospital for Consumptives, Brompton. Pp. v+119. London: J. and A. Churchill, 7, Great Marlborough Street, W. 1. 1921. Price 9s. 6d. net.

[2] "Public Health: Chemistry and Bacteriology. A Handbook for D.P.H. Students." By David McKail, M.D. (Glasg.), D.P.H. (Camb.), F.R.F.P.S.G., Lecturer on Public Health and Forensic Medicine, St. Mungo's College, Glasgow. Pp. viii+409. Bristol: John Wright and Sons, Ltd. Price 6s. 6d. net.

[3] "Physiological Principles in Treatment." By W. Langdon Brown, M.A., M.D., F.R.C.P., Physician, with charge of out-patients, St. Bartholomew's Hospital, etc. Pp. vii+427. London: Baillière, Tindall and Cox. 1920. Price 8s. 6d. net.

that is serviceable in the new physiology, and it has been written by one who has been fortunate to be able to combine the practice of medicine with the teaching of physiology. Some idea of the scope of this exceptionally interesting work may be indicated by an enumeration of the chief subjects dealt with: The principles of organo-therapy, the rational treatment of gastric disorders, mechanical factors in digestion and indigestion, the work of the pancreas, uric acid and purin bodies, oxaluria, phosphaturia and urinary calculi, albuminuria and the treatment of nephritis, glycosuria and diabetes, acidosis and acid intoxications, intestinal intoxications, irregular action of the heart, the vasomotor system in disease, on cyanosis, vitamines and calcium salts. The volume contains a serviceable bibliography. A study of such a work as this will go far to establish a truly scientific spirit in those who are entering upon or already engaged in the practice of medicine.

Professor Georges Dreyer, of Oxford, in collaboration with Mr. G. F. Hanson, has published a series of tables and directions for the assessment of physical fitness.[1] It is assumed that while definite relations cannot be said to exist between age, height, and weight, yet certain relations do exist between body-weight, trunk-length (*i.e.*, the height taken when sitting), and chest-circumference, and that these bear a uniform relation to the vital capacity of the lungs. It is suggested that the tables and methods advocated will be of service in the examination of candidates for life assurance and for the services, and may be useful for guidance in the treatment of disease, especially pulmonary tuberculosis. From investigations which have been carried out on school-children there would seem to be grounds for doubting whether physical fitness or the tendency to morbid states can be assessed by such measurements as are advocated. The work of Professor Dreyer is of exceptional interest and much suggestiveness, and we direct special attention to it here in the hope that school medical officers, tuberculosis officers, and medical superintendents of sanatoria will undertake a series of observations in accordance with the method indicated in Professor Dreyer's monograph and tables.

Mr. C. T. Kingzett, the author of many well-known works on chemistry and chemical subjects, has just issued an excellent popular Chemical Dictionary.[2] This publication meets a real need. It is, of course, alphabetically arranged, and under each head a definition or description is presented in terse form, yet giving essential information in a clear and serviceable manner. The author defines his aim thus: "To give in one volume, in compendious form, and in simple language, descriptions of the subjects of chemistry, its laws and processes, the chemical elements, the more important inorganic and organic compounds and their preparation or manufacture and applications, together with illustrated descriptions of chemical apparatus." The volume is sure to be a much-used reference work, for it provides just the practical

[1] "The Assessment of Physical Fitness by Correlation of Vital Capacity and Certain Measurements of the Body." With tables. By Georges Dreyer, C.B.E., M.A., M.D., Fellow of Lincoln College, Professor of Pathology in the University of Oxford, in collaboration with George Fulford Hanson, late Lieutenant American Medical Air Service. Pp. xi+116. London: Cassell and Co., Ltd. 1920. Price 10s. net.

[2] "Popular Chemical Dictionary." By C. T. Kingzett, F.I.C., F.C.S. Pp. vi+368, with diagrams and illustrations. London: Baillière, Tindall and Cox. 1920. Price 15s.

information desired by ordinary mortals. The book is well printed and is strongly bound, and is altogether a workmanlike production.

The last volumes of the "Transactions of the American Climatological Association" to reach us provide issues of exceptional interest to students of tuberculosis.[1] There is an admirable memoir and portrait of the late Sir Hermann Weber, a reproduction of Sir Hubert Herkomer's fine oil painting of 1902, and among the articles of special interest may be mentioned the following: "Five Years' Experience with Artificial Pneumothorax," by C. D. Parfitt and D. W. Crombie; "Comparative Results obtained in the Treatment of Pulmonary Tuberculosis," by H. M. Kinghorn; "The Soldier and Tuberculosis," by E. O. Otis; "A Tuberculosis School for Patients and Observation Hospital," by J. H. Pratt; "The Treatment of Tuberculosis in the Army Hospitals," by H. W. Hoagland; "End Results of Employment of Ex-Patients in Sanatoria for Tuberculosis," by H. L. Barnes; "Some Lessons of the War in Pulmonary Tuberculosis," by G. B. Wells.

The Red Cross has everywhere been conspicuous on the blood-stained fields of battle and in the lands devastated by war. The handsome volume prepared by Mr. Henry P. Davison, Chairman of the War Council of the American Red Cross, is a fascinating record of the notable services rendered by the American Red Cross, and is a work which should be read not only by medicals and war workers, but by all who hope and strive for human betterment.[2] The story of the work of the American Red Cross during the Great War is most effectively set forth, and is further illustrated by a number of striking pictures. When the war closed more than thirty million Americans were enrolled in the organization: the service of these workers is admirably summarized in Mr. Davison's striking book. It is impossible in a brief notice to give any idea of the character, nature, details, and effects of this far-reaching effort to arrest and alleviate human misery. Reference is made to the excellent work carried out in the treatment of tuberculous soldiers, education of civilians, and care of children. All interested in Red Cross work should read this wonderful story of a remarkable service.

Medical observers have learnt from recent experiences that social medicine must be studied in all its world-wide aspects. Many ills, physical and psychical, have now to be considered in their international bearings. And it is to storm-tossed Russia that many inquiring eyes are turned. Much interesting information regarding Russia and the Russians and the evolution, aims, methods, and meaning of Bolshevism can be found in a little work which has just reached us, entitled "Bolshevik Russia."[3]

[1] Transactions of the American Climatological Association. Vols. xxxiv. and xxxv. Edited for the Association by Dr. Guy Hinsdale, Hot Springs, Virginia, U.S.A.

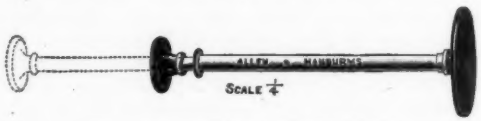
[2] "The American Red Cross in the Great War." By Henry P. Davison, Chairman of the War Council of the American Red Cross. Pp. xii + 303. New York: The Macmillan Company. 1919.

[3] "Bolshevik Russia." By G. E. Raine, in collaboration with Edouard Luboff, LL.D. Pp. 192. London: Nisbet and Co., Ltd., 22, Berners Street, W. 1. 1920. Price 1s. net.

PREPARATIONS AND APPLIANCES.

A TELESCOPIC STETHOSCOPE.

A STETHOSCOPE is the most essential of instruments for the clinical examination of the chest. Since Laennec introduced his original simple stethoscope much ingenuity has been devoted to the development of means whereby auscultation shall be perfected. Dr. Noel Alder, of Hove, has introduced a new TELESCOPIC STETHOSCOPE, concerning which he has favoured us with the following notes:[1] "The stethoscope which I have devised is simply a straight monaural stethoscope capable of adjustment to various lengths by means of two metal tubes, which are telescoped with one another. The outer tube carries the ear piece, the inner terminates in the chest piece. A screw on the distal end of the outer tube makes it possible to fix the tubes in any position. This arrangement gives to it certain advantages over the common type of instrument. The idea of an adjustable stethoscope occurred to me after I had seen Dr. W. Gordon's article in last August's issue of the *Practitioner* on the 'Differences in Value of Different Modes of



THE TELESCOPIC STETHOSCOPE.

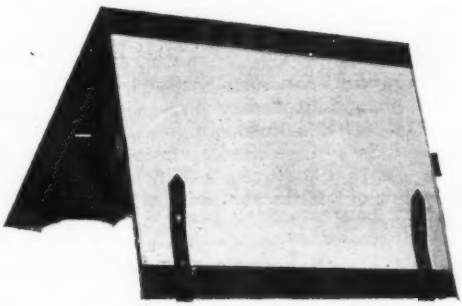
Auscultation.' Dr. Gordon demonstrated clearly the superiority of the straight wooden instrument, and drew attention to the curious fact that with the monaural stethoscope aortic regurgitant murmurs are better heard than the murmurs of mitral regurgitation, and that with the binaural instrument 'for some reason mitral murmurs are more easily heard even when very slight.' The explanation of this apparent paradox must surely lie in the physical properties of the respective stethoscopes. It seems to me that the rigid monaural acts as a resonator, and therefore increases the sound, which has the same pitch as the stethoscope. The 'Telescopic Stethoscope' should not be applied in any fixed position; but in sliding the tubes gently in and out we can effect that the sound is, as it were, 'focussed' in a way similar to the focussing of an object in an optical instrument. By virtue of its adaptability of resonance the 'Telescopic Stethoscope' can also be used as a differential stethoscope. I was surprised to find how much more distinctly both pulmonary and cardiac sounds grow when the instrument is variously extended; I should think that if it were made of sufficiently long tubes and tuned and marked at appropriate intervals,

[1] The instrument has been made by Messrs. Allen and Hanburys, Ltd., 48, Wigmore Street, London, W. 1, from whom it can now be obtained. Price 12s. 6d.

it would be possible to register definite relations between the sounds of the heart. Lack of material and leisure prevent me from going into the subject more fully at present; I therefore venture to submit the 'Telescopic Stethoscope' to the trial and judgment of others who perhaps will establish some definite laws concerning the 'harmonies of the heart.'"

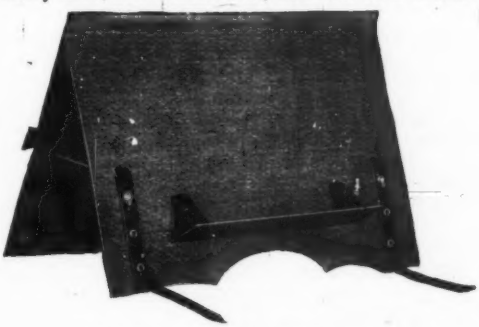
A WRITING AND READING STAND.

Under the designation of THE "LIANRITE" there has been introduced a simple, novel, convenient appliance for patients who are



THE "LIANRITE" (FRONT VIEW).

compelled to spend much of their time lying in bed or reclining on a couch.[1] This serviceable contrivance provides a writing- and blotting-pad, a stationery-case, and a book-rest, and will be a much-valued com-



THE "LIANRITE" (BACK VIEW).

panion for hospital and sanatorium patients. The "Lianrite" should also be of value in the conduct of open-air schools.

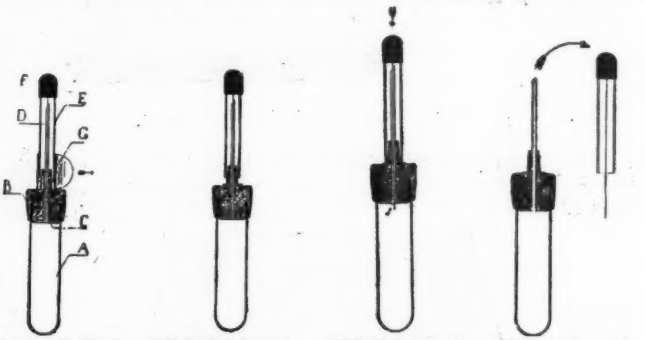
[1] The "Lianrite" is supplied by Messrs. Truslove and Harrison, Ltd., 6B, Sloane Street, S.W. 1; 14A, Clifford Street, W. 1; and 153, Oxford Street, W. 1. Price: Art linen, 9s. 6d.; leather front, 12s. 6d: postage, 6d.

PAPER HANDKERCHIEFS.

In hospitals, sanatoria, and other centres where consumptives are to be found it should be a rule that paper handkerchiefs are always used. Even for non-tuberculous patients with catarrhal conditions of the respiratory passages it is most desirable that the ordinary handkerchief should be replaced by one that can be destroyed when it has become contaminated with infective organisms. The Toinoco Handkerchief Co., Ltd., 55, Hatton Garden, E.C. 1, are providing excellent paper handkerchiefs for use in sanatoria, schools, the sickroom, and elsewhere.[1] Every medical officer and nurse should realize the importance of these handkerchiefs as rational prophylactic agents, and should insist on their patients using them.

THE "TUBUNIC" AMPOULE SYRINGE.

The new "TUBUNIC" AMPOULE SYRINGE should prove of value in hospital, sanatorium, and dispensary work, as well as in general practice.[2] It provides a self-contained equipment for reliable treatment by hypodermic injections, syringe, needle, ampoule, and solution being all contained in a compact outfit of $2\frac{3}{4}$ inches in length. Absolute accuracy of dosage of sterile solutions is insured. Each ampoule



A, Barrel. B, Nozzle. C, Enclosing capsule. D, Needle. E, Glass hood. F, Stylet. G, Ferrule.

"Tubunic" Ampoule Syringe with ferrule removed.

"Tubunic" Ampoule Syringe, with perforated capsule.

"Tubunic" Ampoule Syringe, ready for injection.

THE "ROCHE" "TUBUNIC" AMPOULE SYRINGE.

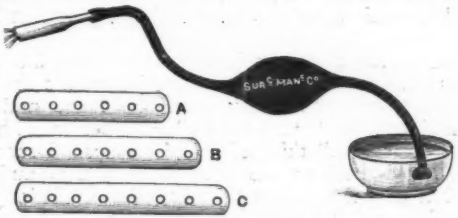
syringe, which contains 1 c.c. of solution, consists of a pure tin collapsible barrel, and is fitted with a sterilized hypodermic needle protected by a glass hood. The chief features of the equipment are indicated in the accompanying figures.

[1] The Toinoco Handkerchief Co., Ltd., 55, Hatton Garden, E.C. 1, supply "Toinoco Silky Fibre" quality at 50 for 2s. in sealed cartons; also in packets at 500 for 18s., and 1,000 for 36s. The "Toinoco Papier Crepon," a stronger form, is provided in sealed packets, 50 for 1s. 9d., 500 for 16s., and 1,000 for 32s.

[2] The "Tubunic" Ampoule Syringe is manufactured by F. Hoffmann-La Roche and Co., Ltd., Basle, and syringe and solution can be obtained, with full particulars, from the Hoffmann-La Roche Chemical Works, Ltd., 7 and 8, Idol Lane, E.C. 3.

A TONGUE DEPRESSOR AND THROAT IRRIGATOR.

A novel but very simple contrivance has been introduced by Miss Kathleen Taylor, of Guy's Hospital, which should be of value in sanatoria and for the treatment of not a few tuberculous subjects. It



THE "BARTON" COMBINED THROAT IRRIGATOR AND TONGUE DEPRESSOR.

consists of a glass nozzle made to fit on to the end of a Higginson's syringe. It is constructed of glass, and is shaped like a hollow tongue-depressor with a "rose" perforated end, through which the irrigating solution flows. The appliance is ingenious and effective, and is likely to be popular.[1]

HOOKER'S MALTED MILK.

Special attention should be directed to Hooker's Malted Milk, for it is a nutrient and stimulant preparation which will be found of special service in hospitals and sanatoria for tuberculous subjects. It will be a valuable adjunct to the dietary of children, and will form an excellent hot drink for scholars in open-air schools. The Malted Milk is available in convenient soluble powder form. It is prepared from pure, fresh, full cream milk combined with the extractives of wheat and barley under strictly supervised hygienic conditions. By means of this preparation a delicious, vitalizing, and restorative food-drink can be obtained with speed and a minimum of trouble. If desired, the beverage can be flavoured with chocolate, vanilla, coffee, etc., or eggs can be added. We have tried Hooker's Malted Milk, and can strongly recommend it, not only for the delicate and afflicted, but as a means of maintaining health and vigour in the physically fit.[2]

THERAPEUTIC AND HYGIENIC PREPARATIONS.

A new form of cod-liver oil has recently been introduced under the designation of "Gadus." It is said to be prepared at the Gadus Cod-Liver Oil Factory at Svolvaer, Lofoten Islands, Norway, by a new process, whereby the danger of premature oxidation is avoided.

[1] The "Barton" Combined Throat Irrigator and Tongue Depressor is supplied by the Surgical Manufacturing Company, Mortimer Street, W. 1. The price is 5s. 6d.

[2] Specimens and particulars of Hooker's Malted Milk can be obtained on application to the makers, Messrs. Thew, Hooker and Gilbey, Ltd., Buckingham.

The oil certainly appears to be of a high degree of purity and general excellence, and is free from the smell and taste which are such objectionable features for many patients. Cod-liver oil has for long maintained a great reputation as a valuable agent in the prevention and treatment of tuberculosis, and the new light provided by recent investigations on vitamines seems to indicate that it is likely to grow in favour. Certainly the "Gadus" Cod-Liver Oil appears to be a particularly excellent brand.[1]

HEROIN has proved of real assistance in the alleviation of useless cough and troublesome local irritation arising in the course of tuberculosis, bronchitis, and other lesions of the lungs and respiratory passages. In the form of "Pinheroin," "Pinheroin with Creasote," and "Pinheroin Pastilles," this sedative is of special service. These pharmaceutical preparations are skilfully designed, and experience has proved that they are therapeutically reliable. Wisely used, they are capable of bringing much amelioration to many chronic lung cases.[2]

"GRINDELINE" is a preparation which is the outcome of a suggestion of the late Dr. Eustace Smith, who strongly advised the use of an extract of *Grindelia robusta* in the treatment of bronchial asthma. Combined with other therapeutic ingredients it provides a serviceable preparation which at this season is of much comfort and real assistance to many who are the subjects of chronic bronchitis and recurrent attacks of bronchial asthma.[3]

"MOLEVAC" is an elegant and very palatable preparation which will be found of considerable value in the management of delicate and tuberculous subjects liable to constipation. It consists of a reliable liquid petrolatum of high viscosity (which does not traverse the intestinal tract too rapidly, as is often the case with plain liquid paraffin), malt extract, and "cascara evacuant." For chronic constipation the preparation is particularly valuable, and it should be given in small repeated doses over a considerable period. In the treatment of many cases of tuberculosis "Molevac" will be found of much service.[4]

"VIROLAX" is an excellent preparation for dealing with cases of intestinal stasis. It is a combination of "Virol" with chemically pure liquid paraffin. It is attractive in appearance, pleasant to the taste, and finds favour both with children and adults. This preparation combines the advantages of a reliable nutrient with those of an effective laxative. It is particularly suited to the requirements of many tuberculous and delicate subjects.[5]

"BYNOTONE" is a combination of malt and marrow fat, soluble in milk and other liquids. "Bynotone" is a nutrient containing food accessory factors necessary for the maintenance of normal metabolism.

[1] The "Gadus" Cod-Liver Oil can be obtained through Messrs. John Bell and Croyden, Ltd., 50, Wigmore Street, W. 1, and all chemists.

[2] "Pinheroin" preparations are prepared by Messrs. Oppenheimer, Son, and Co., Ltd., 179, Queen Victoria Street, E.C. 4.

[3] "Grindeline" is prepared by Messrs. Oppenheimer, Son, and Co., Ltd., 179, Queen Victoria Street, E.C. 4.

[4] "Molevac" is prepared by Messrs. Parke, Davis and Co., 50-54, Beak Street, Regent Street, W. 1, from whom specimens and particulars can be obtained on application.

[5] "Virolax" is manufactured by Virol, Ltd., 152-166, Old Street, E.C. 1, and specimens and particulars can be supplied to medical practitioners on application.

It is a granular powder, and can be easily administered to children as well as adults.[1]

"YADIL" continues to find favour in the treatment of bronchitis and other pulmonary lesions, and has undoubtedly proved of service in many cases of tuberculosis, and especially in such patients as are the subjects of mixed infection.[2]

"POTEX" is a recently introduced form of embrocation which has been found of service in dealing with fibrositis, lumbago, chilblains, and the like. It seems likely to be of special service in preventing and relieving some of the aches and pains met with in patients undergoing open-air treatment, especially in wet and wintry weather.[3]

"KAYTOR" is a new local application for use in pruritus and similar troublesome conditions involving skin and mucous membranes.[4]

Under the title of "PAX," a new insecticide, disinfectant, anti septic, and deodorizer has been placed on the market. It is excellent, not only for service in connection with human requirements, but for use in farm work and as a prophylactic against attacks by insects and other pests.[5]

In the construction of hospitals and sanatoria, open-air schools, and other habitations, special consideration must always be given to the provision of strong, reliable, easily adjustable windows. Many excellent forms of casement and folding windows are now available. We have recently received illustrations and particulars of the Hoffman Casement Fixtures, which have found much favour in America. Architects and others preparing for the erection of new buildings should make a point of investigating these new casements.[6]

With spring not far off, plans must be prepared for the repair, redecoration, and general preservation and painting of all wooden constructions in connection with sanatoria. As a reliable wood preservative, staining agent, and preventive of dry rot, SOLIGNUM deserves consideration.[7] It possesses powerful antiseptic and disinfectant properties.

The Maltine Manufacturing Company, Ltd., have issued their Diary for 1921 in its customary and much approved form. It will be useful to doctors and others as a practical remembrancer and convenient record book.[8]

[1] "Bynotone" is supplied by Messrs. Allen and Hanburys, Ltd., 37, Lombard Street, E.C. 3, and a specimen and particulars will be sent to any medical practitioner making application for the same.

[2] "Yadil" as a preparation of trimethenal allylic carbide is now available in three forms—the Antiseptic, the Antiseptic Elixir, and the Antiseptic Crême de Menthe. Particulars may be obtained from the manufacturers, Messrs. Clement and Johnson, Ltd., 19, Sicilian Avenue, W.C. 1.

[3] "Potex" is made by the Sanitas Co., Ltd., Locksley Street, Limehouse, E. 14.

[4] "Kaytor" is made by the Sanitas Co., Ltd., Locksley Street, Limehouse, E. 14.

[5] The sole selling agents for "Pax" are Messrs. J. Allman and Sons, Ltd., 9, Cullum Street, E.C. 3.

[6] The Hoffman Casements are made by the Andrew Hoffman Manufacturing Company, 5,031, South State Street, Chicago, U.S.A.

[7] Solignum is manufactured by Major and Co., Ltd., Hull, from whom full particulars can be obtained on application. London offices: 205, Borough High Street, S.E. 1.

[8] The Diary for 1921 is published by the Maltine Manufacturing Company, Ltd., and Messrs. Carnrick and Co., Ltd., 183, Acton Vale, W. 3, who are also always willing to send free specimens of their specialities to medical practitioners.

REQUISITES FOR THE DOCTOR OR THE PATIENT.

Open-air treatment, although associated with physical benefits and many delights, is not without its trials and disadvantages. The chief of these arise from the variable conditions occurring in this country from changes in temperature and other climatic states. The inclemencies of weather have always to be provided for, and in meeting these adequate care must be taken in the selection of proper clothing. Doctors and nurses engaged in sanatorium work, as well as patients undergoing treatment, need to be properly equipped. As a means of securing suitable safeguarding from wind and rain, the long black, half-lined oilskin coats worn by sea-going men and others engaged in duties entailing exposure to rough weather will be found of exceptional service. These can now be obtained at reasonable prices and in various sizes suitable for doctors, nurses, patients, and out-of-door workers.[1]

Among those who live the open-air life and still desire to shave, some form of safety razor is now generally used. The chief drawback to such is the need for replacing the blades. The introduction of the Douglas Pruner MONKEY STROP now provides patients and others with a convenient and serviceable little appliance whereby the owner of a safety razor may now sharpen his own blades. The contrivance is an ingenious and effective one, and is sure to be popular.[2]

Many consumptive and other tuberculous patients gain much comfort by being allowed a moderate indulgence in tobacco. If carefully regulated, smoking may generally be allowed, but it must be understood that in all cases patients will loyally act under medical directions. Various firms now provide mild forms of cigarettes which give rise to no serious irritation of the lungs or air passages. Messrs. Abdulla and Co., Ltd., the far-famed firm of cigarette specialists, provide several excellent brands which are particularly suited to the requirements of invalids and chest cases. Reference may here be made to the "Abdulla Almanac for 1921," which is well suited to have a prominent place in the office or some other central position of every sanatorium and hospital. It includes thirteen fine reproductions in colour of drawings by well-known modern artists.[3]

All tuberculous patients and others undergoing open-air treatment should be subjected to systematic dental inspection, and should be taught the essentials of dental hygiene. Among the numerous excellent forms of dentifrice now available, special reference should be made to KOLYNOS DENTAL CREAM. This is not only a reliable antiseptic and cleansing agent for mouth and teeth, but, as we can testify from long experience, is an exceptionally delightful preparation with agreeable flavour, and most refreshing for mouth and throat. It is supplied in collapsible tubes according to a formula provided by Dr. N. S. Jenkins.[4]

[1] Messrs. Jennings, Ltd., Earlsmead Joinery Works, Pennywell Road, Bristol, are now supplying black oilskin coats at 21s. 9d. each. The same firm provides tables and forms, woodwork tools, etc., suitable for service in tuberculosis colonies, sanatoria, open-air schools, etc.

[2] The Monkey Rotary Strop is manufactured by Messrs. Douglas, Kirby and Co., Gloucester. Price 5s.

[3] Particulars of the Abdulla specialities and copies of the Abdulla Almanac may be obtained on application to Abdulla and Co., 173, New Bond Street, W. 1.

[4] Specimens and full particulars of Kolynos may be obtained from Kolynos Incorporated, 156, Aldersgate Street, E.C. 1.

Among the indispensables for open-air life a Waterman's IDEAL FOUNTAIN PEN must occupy a prominent place. It is a necessity both for staff and patients of all institutions run on open-air lines. We have used this form of pocket companion for many years, and with increasing appreciation. It is now available in three chief forms, and for sanatorium service undoubtedly the best is the self-filling type. As a present for a patient undergoing hygienic management nothing could be better. For simplicity and efficiency this form of fountain pen cannot be beaten.[1]

Doctors and patients under hospital and sanatorium conditions find much use for pencils, and where these are in active service the "White Queen" PENCIL SHARPENER will be found of the greatest convenience.[2] It is a compact little contrivance where both wood and lead of the pencil are effectively trimmed. There is nothing to get out of order, and it can easily be carried in the pocket.

Under the title of "Medicamenta Recentia," Messrs. Allen and Hanburys, Ltd., have just issued a compact directory to their specialities. The arrangement is alphabetical, and will be found of much service for rapid reference. There is also an excellent remembrancer in the form of a Therapeutic Index.[3]

House and Garden is a delightful monthly journal which is to be commended to the notice of all lovers of the artistic and beautiful in home affairs. The illustrations are charming, and the articles suggestive and serviceable.[4]

Tuberculosis officers and others engaged in educational propaganda will be well advised to study the informing handbook on Travelling Publicity Campaigns recently issued by the Russell Sage Foundation.[5] They should also make a point of seeing the suggestive publications of the American National Tuberculosis Association.[6] This body has just published an attractive booklet, "In this Sign," which provides an informing and appealing story of the Crusade of the Double-Barred Cross, under the auspices of the N.T.A.

[1] Particulars regarding the various types and varieties of the Waterman Ideal Fountain Pen can be obtained on application to The Pen Corner, Kingsway, W.C.

[2] The "White Queen" Pencil Sharpener is supplied by E. S. Perry, 171, Queen Victoria Street, E.C. 4. Price 2s.

[3] "Medicamenta Recentia" is to be issued in revised form at regular intervals, and copies may be obtained by medical practitioners on application.

[4] *House and Garden* is now published monthly in this country at Rolls House, Bream's Buildings, E.C. 4. Price 1s. net each number.

[5] "Travelling Publicity Campaigns: Educational Tours of Railroad Trains and Motor Vehicles, by Mary Swain Routzalm. Pp. xi+151, with 19 illustrations. New York: Russell Sage Foundation, 130 E., 22, D Street. 1920. Price $1,50 net.

[6] The Headquarters of the American National Tuberculosis Association are at 381, Fourth Avenue, New York City.

THE OUTLOOK.

TUBERCULOSIS AND THE MINISTRY OF HEALTH.

THE Campaign against Tuberculosis has now reached a stage when there must be such a unification of direction as shall be able to secure proper co-operation and co-ordination among the various agents and agencies now engaged in the struggle against the common foe. In these difficult days of reconstruction endeavours must be made to readjust ideas and develop measures in the light of experience and with a fuller realization of the need for the application of scientific principles in the practical conduct of all educational, hygienic, therapeutic, and humanitarian work. Voluntary efforts have accomplished much, but their influence is likely to become increasingly restricted. Throughout the land an organized campaign must be conducted. There should be efficient direction and control both at the centre and at the periphery. Progress is now being made in the elaboration and establishment of definite schemes. In 1919 the powers and duties of the Local Government Board in relation to the tuberculosis schemes of counties and county boroughs and of the Insurance Commissioners with respect to the work of Insurance Committees were transferred to the Ministry of Health, and now we are approximating to the desired and indeed essential central and local unified control of public anti-tuberculosis work. The present position of the best informed medical opinion with regard to the fundamental points which must be recognized in arranging for an effective organization and judicious administration are fully expressed by Sir George Newman in his recently issued report as Chief Medical Officer of the Ministry of Health.[1] A somewhat lengthy but very informing quotation may be permitted:

"Tuberculosis remains one of the formidable enemies of the race. It is protean in its forms and almost universal in its incidence. Relatively few persons escape its infection, and while there are some indications of a lessened mortality, there are as yet few of a declining prevalence. Stress and strain, malnutrition, fatigue, susceptible constitution, industrial life, predisposing disease, social and sanitary circumstances, poverty, and the ubiquity of the tubercle bacillus all play a part in its occurrence. It takes its toll of both sexes and at all ages, but particularly in adolescence and early life. There can be but one way of grappling with such a malady, and that is the broadest possible attack. It is futile and misleading to encourage a narrow outlook or regard any single or isolated method of treatment as a panacea. An improved environment is not enough; nutrition and an open-air life are not enough; the use of tuberculin or any other drug is insufficient; the

[1] Ministry of Health: Annual Report of the Chief Medical Officer, 1919-1920. Published by H.M. Stationery Office, Imperial House, Kingsway, London, W.C. 2. [Cd. 978.] 1920. Price 3s. 6d net.

dispensary, sanatorium, hospital, or village settlement is each by itself inadequate; a model way of life and hygiene will not meet the case—all are necessary and all must be thoroughly co-ordinated or unified. Even when we turn to medical practice we have to recognize a variety of clinical types of tuberculosis, each demanding its appropriate treatment. The individual must be studied as well as the disease; a form of treatment appropriate at one stage is contradicted at another. Medical observation of the patient must be maintained over a long period of time, and after-care is always essential. Much more knowledge, too, is needed, clinical and epidemiological, for doubt and disappointment abound. But even in the present rather difficult and critical stage some things are certain. First, we must fortify the *powers of resistance* of the individual by sound nutrition—a very large and important sphere—and, where practicable, by immunization. Secondly, we must prevent, as far as may be, the *spread of infection* from the diseased, and by means of milk and meat. Thirdly, we must press on with all the *general sanitary reform* which is necessary, including improved housing, lessened overcrowding, industrial welfare, the teaching of hygiene, the extension of open spaces, healthy school life, and so forth. Lastly, we must revise the organization of the *particular method* with which we have made a substantial beginning—notification, domiciliary and dispensary treatment (398 dispensaries), open-air schools, tuberculosis officers (300), the sanatorium (176 sanatoria, with 9,600 beds), the training colony, the hospital for pulmonary and non-pulmonary cases (3,800 beds for adults and 2,300 for children), the village settlement and proper means of after-care; and the local administration of these matters must be unified under the local authority and its medical officer of health. Arrangements must be made by which the sanatorium patient may, if necessary, pass through three stages of treatment—the sanatorium, the training colony, and the village settlement. The number of fresh cases of tuberculosis notified in 1919 in England and Wales was 77,511, and the number of deaths attributed to all forms of tuberculosis was 46,312. This, in a few words, is our outlook. It resolves itself in large degree into a question of administration and finance. The relatively high and early mortality of cases discharged from sanatoria is discouraging—though that is by no means the only criterion to apply—and we are tempted to condemn the sanatorium. But before we 'scrap' the sanatorium as a failure, we must inquire into—(*a*) the form of sanatorium which is used and its *management*; (*b*) the selection of cases admitted; (*c*) the length of residence; (*d*) the character of the treatment provided; (*e*) the nature and degree of the training undertaken; and (*f*) the after-caken, supervision and post-treatment, occupation, and life of the patient. The time has not arrived for the condemnation of the sanatorium method, but for the careful consideration of its revised application."

Dr. F. J. H. Coutts, as Senior Medical Officer of the Department of the Ministry of Health, dealing with tuberculosis, provides a very lucid and up-to-date presentation of the case as viewed from a national standpoint. Compulsory notification of all forms of tuberculosis now exists. In 1919 there were 65,229 notifications of pulmonary tuberculosis and 16,821 of non-pulmonary tuberculosis, a total of 82,050. (These figures include duplicate notifications.) Considerable laxity exists in carrying out the duty of notification. The notification figures

of one area cannot be considered strictly comparable with those of another area. It must also be remembered that the notification returns for any particular year give only an incomplete record of the number of persons commencing to suffer from tuberculosis during the year. After studying all the statistics available it would seem that there has been a considerable decline in notifications both of pulmonary and non-pulmonary tuberculosis between 1918 and 1919; the notification figures for the year are the lowest recorded since the complete system of notification came into force. In 1919 the deaths in England and Wales from tuberculosis were as follows: Pulmonary—males, 19,581; females, 17,081; total, 36,662, Non-pulmonary — males, 4,969; females, 4,681; total, 9,650. These figures include the deaths of tuberculous ex-service men who have been discharged from the Services and so been reabsorbed into the civilian population. The statistics available indicate a considerable rise in the death-rate from pulmonary tuberculosis during the years of war. "Whilst the deaths from *all forms* of tuberculosis in 1918 were higher than in any year since 1904, and more deaths from pulmonary tuberculosis were recorded in 1918 even than in 1904, the deaths in 1919 both from pulmonary and non-pulmonary tuberculosis are the smallest recorded in this country for many years, and the death-rates calculated on the normal population are the lowest on record both for pulmonary and for non-pulmonary tuberculosis." The above figures would seem to indicate that the rise in the tuberculosis mortality between 1914 and 1918 was due to the prevalence of war conditions. Even in spite of housing difficulties, which are still acute, it is manifest that causes are at work leading to a reduction in the death-rate from tuberculosis. Dr. Coutts makes a suggestion which deserves impartial consideration: "It is conceivable that in addition [to improvement in general sanitation] now War stresses are over, we are beginning to reap the fruits of the special campaign which was instituted some years ago. Notification and the measures taken in connection therewith; action taken to prevent indiscriminate spitting; the active interest taken in the question of the prevention of the consumption of tuberculous milk; the extending use of pasteurized and dried milks; the general education of the public as to the dangers of massive infection from tuberculosis; the segregation of acute and advanced cases of tuberculosis in hospitals and sanatoria; the efforts made to obtain separate sleeping accommodation in the home for patients suffering from the disease, may all contribute to the result. Even although some may doubt the value of sanatorium treatment in bringing about arrest or cure of the disease in individual patients, the removal of so many infective persons even temporarily from their homes must have materially reduced the risk to others. In addition the educative effect of a period of residence in a sanatorium must gradually tend to greater care being taken in the home and in the workshop as regards disposal of sputum and in avoidance of conditions likely to cause spread of infection to others." Dr. Coutts gives interesting information regarding the progress of tuberculosis schemes. Reference is made to the fact that "unfortunately there has been a desire on the part of some tuberculosis officers to consider theirs as a special detached service, and to regard their work as a purely clinical service and entirely independent of the Public Health Department." The view of the Ministry of Health on this point is perfectly clear:

"Progress in the prevention of tuberculosis will assuredly be retarded unless the tuberculosis service is carried out under conditions which render it practically an integral part of the general public health service. In the provinces the tuberculosis officer is usually on the staff of the County or County Borough Medical Officer of Health, and it would appear desirable to arrange in London for the tuberculosis officer to be attached to the Public Health Department of the Metropolitan Borough in which his dispensary is situated." The Report contains special sections on Residential Institutions, Training Colonies, Village and Industrial Settlements, and After-Care Work. The Ministry of Health is clearly desirous of assuring a wise leadership in the struggle against tuberculosis, and it is the simple duty of all patriotic citizens to lend such aid as will be serviceable. In the Appendix there is a suggestive study on "The Epidemiology of Pulmonary Tuberculosis," by M. Greenwood, M.R.C.P. At the present time a heavy responsibility rests upon everyone taking a part in the tuberculosis campaign. Every warrior in this conflict must consider his foe. It is up to him to strengthen his weapons for offence and defence, and to give unremitting care to the scientific study of the principles and practice which must govern strategy and guide in the conduct of the fight.

The Ministry of Health during recent months have issued various official communications dealing with Institutional Treatment of Tuberculosis. On December 3 a circular [149] was issued to Metropolitan Borough Councils on Dispensary Treatment in London. The following are the suggestions put forward:

"1. Arrangements should be made for the complete co-ordination of the work of the dispensary with that of the Public Health Department of the Council; and the Ministry are of opinion that, if this is to be secured, it will be necessary for each Tuberculosis Officer to be appointed as an Assistant to the Medical Officer of Health of the Borough for tuberculosis work, and be given a responsible share of the control, under the administrative direction of the Medical Officer of Health, of the whole of the tuberculosis work in the portion of the Borough served by his dispensary. Such an appointment, in the case of a voluntary dispensary, would not of course affect the right of the Tuberculosis Officer to report direct to the managing body of the dispensary. 2. The working week of a whole-time Tuberculosis Officer should not in any case be less than thirty-six hours, and it is suggested that, as a normal basis, there should be one whole-time Tuberculosis Officer to about every 160 deaths from tuberculosis per annum. In dispensary areas which require on this basis the services of more than one whole-time Tuberculosis Officer, but less than two whole-time officers, part-time Assistant Tuberculosis Officers might be appointed; and there should be at least one dispensary nurse, whole or part-time, for each whole-time Tuberculosis Officer or part-time Assistant Tuberculosis Officer. These nurses should work under the direct control of the Tuberculosis Officer, and their work should be properly co-ordinated with the general work of the dispensary. In those cases in which the adoption of the suggested basis would involve an addition to the existing staff of the dispensary, the Borough Council will of course have regard to the present financial position of the Borough. 3. The Ministry understand that the London County Council propose to

arrange for the provision of a sufficient number of Consulting Centres to serve the whole of the dispensaries in London. These Consulting Centres, equipped with observation beds and having physicians with special experience in tuberculosis, will be provided, if possible, at certain of the London Hospitals. Tuberculosis Officers will have access to the observation beds, and consultations upon the occupants of these beds and upon other patients brought by Tuberculosis Officers should take place at regular intervals. When this provision has been made, the existing arrangements of the Borough Councils with hospitals will be unnecessary, as each dispensary will be linked to one of the Consulting Centres. It is anticipated that these Consulting Centres will prove of considerable assistance to Tuberculosis Officers in their work. The provision of a large number of observation beds should be the means of ensuring that each case receives the appropriate form of treatment, whether residential or otherwise, and should improve and cheapen the working of the tuberculosis scheme for London. 4. In order to arrive at the earliest possible date at a definite diagnosis in doubtful cases of tuberculosis which present themselves at the dispensaries, there should be shorter periods of observation combined with more intensive study of each case, full use being made of the facilities and aids to diagnosis afforded by the Consulting Centre. 5. Treatment at the dispensary, as distinct from diagnosis, consultation, and general supervision, should as a rule be limited to patients whose continued treatment requires special knowledge or technical skill, and to those who are unable to obtain other adequate medical attendance. Patients who require treatment which can, consistently with the best interests of the patient, be properly undertaken by a general practitioner of ordinary professional competence and skill, and who are either insured persons or can afford to pay for medical attendance, should not be encouraged to attend the dispensary for routine treatment. 6. The practice of treating patients at the dispensaries on a large scale and over prolonged periods with bottles of medicine, cod-liver oil, etc., and of giving medicines to ensure the attendance of patients, should be discouraged. Patients should rather be educated out of the belief in the efficacy of drugs, and be taught the value of personal advice and of instruction in a hygienic mode of life. 7. The fullest possible measure of co-operation should be developed between the dispensary service and the school medical service, and children attending the dispensary, who are probably not suffering from tuberculosis, and others suffering from ill-health not due to tuberculosis, should be transferred to the School Medical Department, arrangements being made for these children to be referred back to the dispensary for further examination whenever necessary. 8. It is desirable that at least one evening session in each week should be arranged at each dispensary, and the question should be considered of instituting a special session on Saturday mornings, or at some other suitable time out of school hours, for children attending schools. 9. Efforts should be made to introduce at the dispensaries a system by which patients would be seen, if practicable, by individual appointment, or other means should be adopted to reduce to a minimum the time during which patients are kept waiting at the dispensary. 10. More adequate arrangements than at present should be made for the examination by the Tuberculosis Officer of the home 'contacts' of newly notified cases, and for the 'following up'

of patients for whose failure to continue in attendance at the dispensary no satisfactory reason has been ascertained. 11. It is important that the Tuberculosis Officer should become personally acquainted, as far as possible, with all medical practitioners practising in the area served by his dispensary, in order that the fullest degree of co-operation may be secured. 12. The local arrangements should be such as will enable the Tuberculosis Officer to visit the homes of dispensary patients, in order to become familiar with the environmental conditions of the patients in his district and to enable him to supervise adequately the work of the dispensary nurses; and he should actually visit, at least once, the home of each patient unless he considers that, in the interests of the patient, such a visit would be undesirable. 13. Adequate clerical assistance should be afforded to the dispensary staff, and, if the ordinary duties of the dispensary nurses do not occupy their whole time, they might render assistance in the clerical work of the dispensary. All communications between the Tuberculosis Officer and the London County Council relating to the treatment or clinical supervision of individual patients should, in future, be made direct." The Circular also refers to the Ministry's letter of the 23rd June last, in which it was intimated that, by an Order made by the National Health Insurance Joint Committee under section 21 (2) of the National Health Insurance Act, 1920, Sanatorium Benefit would cease to be included amongst the benefits conferred on insured persons by Part I. of the National Insurance Act, 1911, on the 1st January, 1921, and where also that it has been found necessary to make further use of the powers of the section in question (which enable the discontinuance of the Sanatorium Benefit to be deferred to a date not later than the 20th May, 1921), and to fix the 1st May, 1921, as the date of discontinuance of Sanatorium Benefit, which will therefore continue to be administered by Insurance Committees till that date.

The Ministry of Health, in a Circular issued to County Councils and County Borough Councils, announce that in the case of Councils which have provisionally made arrangements for the performance of administrative work at present undertaken by the Insurance Committees of their areas in relation to the treatment of tuberculosis, it is hoped that it will be possible to defer these arrangements till the 1st May without serious inconvenience. It is suggested that the postponement will afford additional time for the completion of arrangements for the provision of institutional treatment upon the termination of Sanatorium Benefit, and it is added that: "If the Council have entered upon any negotiations for the retention, as from the 1st January next, of beds at approved residential institutions in continuation of arrangements at present made by the Insurance Committee, the Council will doubtless communicate at once with the Insurance Committee with a view to that Committee undertaking financial responsibility for the retention of the beds to the 30th April next, either direct or through the Council."

PUBLIC HEALTH (TUBERCULOSIS) BILL.

This measure, brought before Parliament last year, demands the careful consideration of all interested in the future development of tuberculosis work in this country. When before the House of

Commons the Minister of Health intimated that it was proposed to proceed only with as much of the Bill as was considered essential to meet the position created by the National Health Insurance Act passed in May, 1920. In view of the probable early reintroduction of the Bill it seems desirable to present here the full text:

A BILL TO MAKE FURTHER PROVISION WITH RESPECT TO ARRANGEMENTS BY LOCAL AUTHORITIES FOR THE TREATMENT OF TUBERCULOSIS.

Duties of County and County Borough Councils to provide Treatment.

1.—(1) It shall be the duty of the council of every county and county borough to make provision to the satisfaction to the Minister of Health for the treatment of tuberculosis at or in sanatoria or other institutions approved by the Minister.

(2) Every such council shall for the purposes aforesaid have all such powers as may be necessary, including, without prejudice to their general powers, power to erect and maintain sanatoria and other institutions, and to make such arrangements as may be necessary with other local authorities and persons.

(3) Where the Minister of Health is satisfied that the council of any county or county borough has failed to fulfil any obligations imposed by this section the Minister may, after giving the council an opportunity of being heard, make arrangements for the carrying out of those obligations by any other local authority or persons and confer on such authority or persons all powers necessary for the purpose.

Any expenses incurred in the exercise of those powers by any such local authority or persons may, if the Minister of Health thinks fit, be paid in the first instance by the Minister out of moneys provided by Parliament, and the amount of any expenses certified by the Minister to have been properly so incurred shall, whether so paid in the first instance or no, be paid to the Minister on demand by the council of the county or county borough and shall be recoverable as a debt due to the Crown.

(4) The power conferred by sub-section (3) of section sixty-four of the National Insurance Act, 1911 (3 and 4 G. V., c. 23), to make provision by the constitution of joint committees, joint boards or otherwise, for the joint exercise of the powers referred to in that section, shall include power to make similar provision for the joint exercise of the powers conferred by section three of the Public Health (Prevention and Treatment of Disease) Act, 1913 (1 and 2 G. V., c. 55), and this Act, and any order made under the said sub-section, before the passing of this Act, constituting any joint committee or joint board shall have effect as though there were included amongst the powers of such joint committee or joint board the powers of a council of a county or county borough under the said section three and under this Act.

(5) A council may exercise any of its powers in relation to the treatment of tuberculosis (other than the power of raising a rate or of borrowing money) through a committee of the council, and may appoint as members of the committee persons (including members of insurance

committees) who are not members of the council, being persons specially qualified by training or experience in matters relating to the treatment of tuberculosis, but not less than two-thirds of the members of every such committee shall consist of members of the council, and a committee established under this section may, subject to any direction of the council, appoint such and so many sub-committees, consisting either wholly or partly of members of the committee, as the committee thinks fit.

Village Settlements.

2.—(1) It shall be lawful—

(*a*) For the council of any county, or county borough, or for the Managers of the Metropolitan Asylums District, subject to the approval of the Minister of Health, to provide and maintain, or assist the provision and maintenance of, village settlements for the benefit of persons suffering from tuberculosis and their families; and

(*b*) For the council of any county, county borough, or metropolitan borough, subject to the approval of the Minister of Health, to provide and maintain, or assist the provision and maintenance of, non-residential establishments for the benefit of persons suffering from tuberculosis,

and any such authority may erect and maintain buildings and do such other things as may be necessary for the purposes of the powers conferred by this section.

(2) Where a voluntary association approved by the Minister of Health submits to the Minister of Health a scheme for the provision of dwelling-houses in a village settlement intended for the benefit of persons suffering from tuberculosis and their families, and the scheme has been approved by the Minister, then—

(*a*) The Public Works Loan Commissioners may, subject to such conditions as the Treasury may require, advance money on loan to that association for the purposes of the scheme, and subsection (2) of section twenty of the Housing, Town Planning, etc., Act, 1919, shall apply to any such loan; and

(*b*) The Minister may, with the consent of the Treasury, and provided the scheme is carried out within such period as the Minister with the consent of the Treasury may specify, pay, or undertake to pay out of moneys provided by Parliament such contributions towards the cost of carrying out the scheme as by section nineteen of the Housing, Town Planning, etc., Act, 1919, as amended by section four of the Housing (Additional Powers) Act, 1919, he is authorized to pay or undertake to pay in the case of a public utility society or housing trust towards the cost of carrying out a scheme for the provision of houses for the working classes, and the provisions of those sections shall, with the necessary modifications, apply accordingly.

Miscellaneous Powers.

3. It shall be lawful for the council of any county or county borough or of any metropolitan borough, subject to the approval of the Minister of Health,

(*a*) To contribute to the expenses of any committee or body of persons approved by the Minister for the purpose of the care or assistance of persons suffering from tuberculosis, or their families; and

(*b*) To make such provision for the giving of lectures and the dissemination of information relating to the prevention and treatment of tuberculosis as the council thinks necessary or desirable.

Powers of Metropolitan Asylums Board.

4. The Managers of the Metropolitan Asylums District may, subject to the approval of the Minister of Health, enter into agreements with the council of any county or county borough for the reception of persons suffering from tuberculosis in hospitals or sanatoria provided by the Managers.

Expenses, Borrowing Powers, etc.

5.—(1) Any expenses incurred under this Act by a county council shall be defrayed as expenses for general county purposes, or if the Minister of Health by order so directs, as expenses for special county purposes charged on such part of the county as may be provided by the order.

(2) Any expenses incurred under this Act by the council of a county borough shall be defrayed as part of the expenses of the council in the execution of the Public Health Acts, 1875 to 1908, and the purposes of this Act shall be deemed to be included in the purposes of those Acts.

(3) Any expenses incurred under this Act by the council of a metropolitan borough shall be defrayed as general expenses of the council.

(4) A council may borrow for the purposes of this section in the case of a county council under section sixty-nine of the Local Government Act, 1888, as if those purposes were mentioned in that section, in the case of a county borough council in the like manner as for the purpose of defraying any expenses incurred in the administration of the Public Health Acts, 1875 to 1908, and in the case of a metropolitan borough council under section one hundred and five of the Public Health (London) Act, 1891, as if the purposes of this Act were mentioned in that section, but money so borrowed shall not be reckoned as part of the debt of any such council for the purpose of any enactment limiting the powers of borrowing by the council.

(5) Any approval or consent given by the Minister of Health under this Act may be given for such time and subject to such conditions as the Minister thinks fit and may be withdrawn at any time if the Minister thinks fit.

Section six applies the Act to Scotland, and declares that it shall not apply to Ireland.

Short Title and Saving.

7.—(1) This Act may be cited as the Public Health (Tuberculosis) Act, 1920.

(2) The powers conferred on any authority by this Act shall be in addition to and not in derogation of any other powers of the authority.

NOTES AND RECORDS.

Tuberculosis continues among our unsolved problems. It is a problem concerning which medical science has still much to learn. And in regard to its social and economic relationships knowledge remains limited. Methods for the early recognition of the disease in its many and varied forms are very imperfect. Treatment is full of disappointment and discouragement. No comprehensive and complete procedure to secure prophylaxis can be adopted. We seem to grope in the dark, and meanwhile expensive, imperfect, and in great measure unscientific schemes are being launched and conducted oftentimes by enthusiasts lacking in clinical experience and administrative competency. Before further elaboration and outlay are sanctioned a full enquiry into all aspects of the tuberculosis problem should be undertaken. For a long time we have urged the necessity for comprehensive investigation with the collection and consideration of all available data by those capable of studying evidence without prejudice or regard for vested interests. Before the Ministry of Health proceed further in the development of complicated and expensive schemes aiming at the prevention and arrest of tuberculosis many are desirous that a Royal Commission or Inter-Departmental Committee should be appointed to consider the Tuberculosis Problem in all its bearings. War and post-war experiences have thrown new light on this problem, particularly in its relation to other medico-sociological problems. Existing financial conditions are compelling us to investigate all services relating to organization and administration of measures seeking the prevention and treatment of tuberculous disease in order to ensure that competency, economy, human sympathy, and a scientific spirit shall be manifest in all.

The Public Health and Housing Department of the City of Birmingham have issued an exceptionally interesting report on all forms of tuberculosis work. Dr. G. B. Dixon, the chief Tuberculosis Officer, provides a report on Treatment and the service of the Anti-Tuberculosis Centre at 44*a*, Broad Street.

The General Secretary of the National Society of Operative Printers and Assistants, Mr. George Isaacs, Caxton House, 26, Blackfriars Road, S.E.1, has favoured us with a booklet containing particulars regarding the Natsopa Memorial House, Temple Hall, Wellesborough, Leicestershire, and the proposed Sanatorium for tuberculous sufferers. This enterprise is in memory of the 341 members who fell in the great war. "They gave their lives; let us commemorate their sacrifice by saving the lives of others."

An appeal is being issued by the British Red Cross Society and Order of St. John of Jerusalem, for the establishment at Barrowmere in

Cheshire of an East Lancashire Tuberculosis Colony for Ex-Service Men. Particulars can be obtained on application to Mr. Leonard Royle, 3, St. James's Square, Manchester.

Mr. E. Chandler Cook, Secretary of the Plymouth Education Authority, has favoured us with copies of illustrated booklets giving particulars of the Open-Air Day Schools at Mount Tamar and Little Efford House, medico-educational endeavours which might well be imitated by other Education Authorities.

Since 1913 there has been no International Tuberculosis Conference. The 1914 meeting should have been held in Madrid, but war prevented. Last October, in Paris, a gathering of representatives interested in tuberculosis work arranged for the re-establishment of a bond between such anti-tuberculosis associations as were within the influences of the League of Nations. An International Union is to be developed with headquarters at Geneva. Professor Léon is President, and Professor Léon Bernard is Secretary, with offices at 3, Rue Las Cases, Paris. It is hoped to be able to arrange for the first of the new series of International Conferences to be held in London some time in 1921.

As we are about to go to press a copy of the Transactions of the Liverpool Conference of the National Association for the Prevention of Tuberculosis has been received.[1] It contains valuable papers dealing with Methods of Prevention and Treatment, Practical Difficulties in connection with the carrying out of Tuberculosis Schemes, and Milk as a Source of Tuberculous Infection. There are reports on the Discussions, and also an account of Professor Benjamin Moore's lecture on "The New Crusade against Tuberculosis." The whole volume merits the careful study of tuberculosis officers, and all others interested in present-day views regarding the combat with tuberculosis.

All working for the prevention and arrest of tuberculosis should make a point of considering Sir George Newman's last report as Chief Medical Officer of the Board of Education.[2] It contains a special section on Tuberculosis in School-Children, in which it is contended that "early diagnosis and differentiation lies at the root of all efforts to secure the eradication of tuberculosis." A list of centres providing institutional treatment is given. A portion of another section is also devoted to the consideration of Open-Air Education, and it is stated that "the development of provision of facilities for open-air education is still very limited, and a number of Local Education Authorities are slow in appreciating the value of such provision."

Dr. Calot is holding a practical course in orthopædics, particularly in regard to lesions of tuberculous origin, at his clinic, 69, Quai d'Orsay, Paris, January 17–24.

[1] Transactions of the National Association for the Prevention of Tuberculosis (20, Hanover Square, London, W. 1) at the Eighth Annual Conference held in St. George's Hall, Liverpool, October 7, 8, and 9, 1920. Pp. xxv+234. London: Adlard and Son and West Newman, Ltd., Bartholomew Close, E.C. 1. Price 12s. 6d. post free.

[2] Annual Report of the Chief Medical Officer of the Board of Education. Pp. iv+231. London: H.M. Stationery Office, Imperial House, Kingsway, W.C. 2. 1920. Price 2s. net.